

FIGURE 2-28 Layout of instruments inside a trailer during SCAQS.

88-495

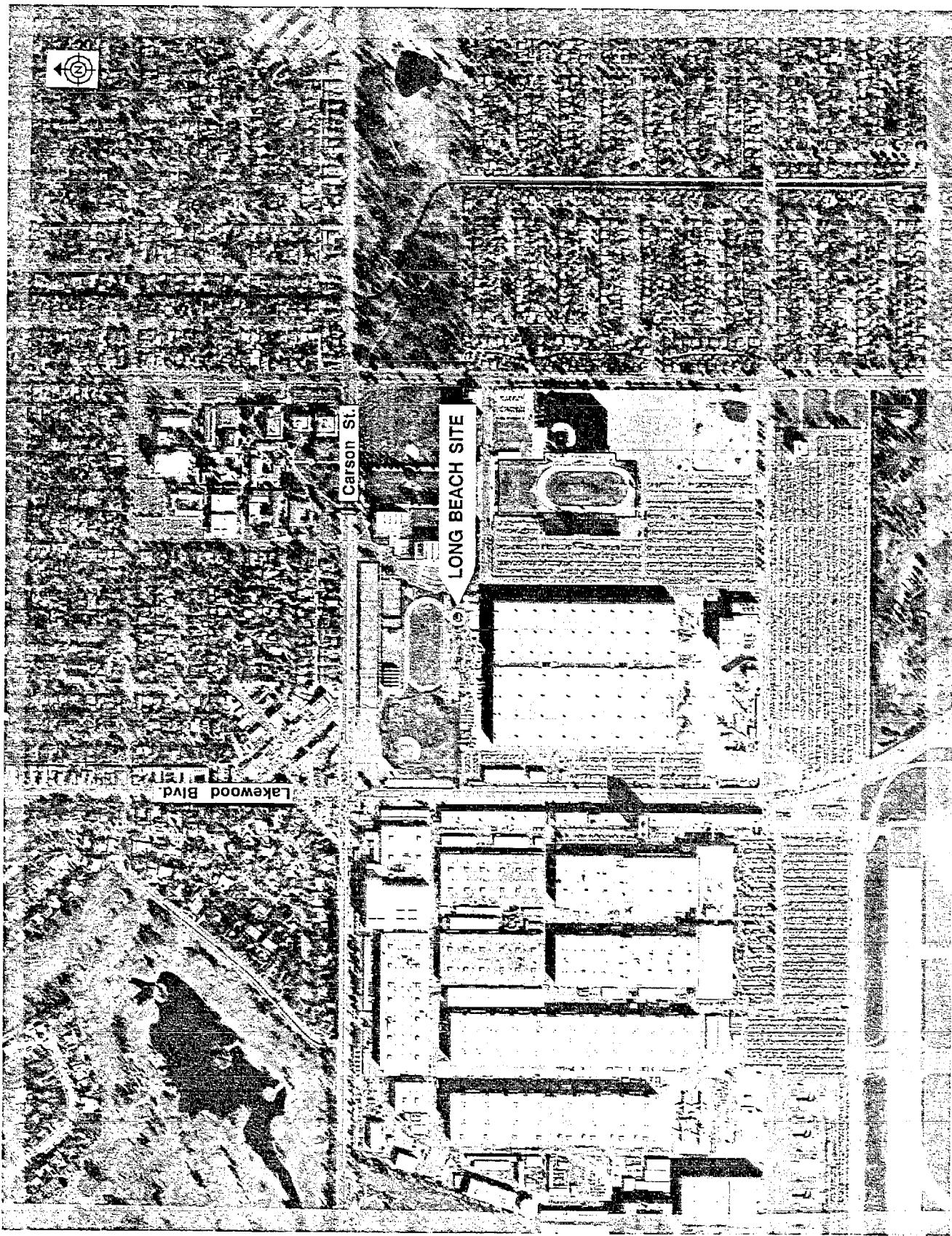


FIGURE 2-29. Long Beach site. Air Photo Services©, Santa Ana, CA

hydrocarbon sampler, a PAN GC, an H<sub>2</sub>O<sub>2</sub> sampler, two air toxics samplers (Tedlar bags and canisters), a Berner, a DRUM, an OPC, an EAA, and a Probe were installed. During the SCAQS fall study period, the H<sub>2</sub>O<sub>2</sub> sampler was removed and a MOUDI was added.

The ARB operated and maintained its instruments in its trailer. AV operated all other SCAQS instruments except the following: the PAN GC, which was operated by DGA, the Berner, which was operated by AIHL; the DRUM, which was operated by UCD; and the MOUDI, which was operated by UM. AV also assisted EMSI in operating the H<sub>2</sub>O<sub>2</sub> sampler.

The SCAQS and air toxics samplers (Tedlar bags) and UV radiometer were obtained from the ARB, the carbonyl sampler from ENSR, the C<sub>1</sub>-C<sub>10</sub> hydrocarbon and air toxics (canisters) samplers from Biospherics, the PAN GC from DGA, the H<sub>2</sub>O<sub>2</sub> sampler from EMSI, the Berner from AIHL, the MOUDI from UM, and the DRUM from UCD. During the summer study period, the nephelometer was obtained from NWC, the OPC from STI, the EAA and PM-10 sampler from EPA, and the Probe from the ARB. During the fall study period, the nephelometer was obtained from the EPA, the OPC from RLAM, the EAA from EMSI, the Probe from STI, and the PM-10 sampler from the ARB.

The SCAQS instrumentation and filter handling area was located in the ARB air quality trailer, with sampling probes 2 to 3 feet above the roof. The SCAQS sampler was on a 2-foot-high platform next to the trailer.

Figures 2-30, 2-31, and 2-32 are photographs of the overall site, the sampler platform, and the inside of the trailer.

#### o San Nicolas Island

Station: San Nicolas Island	Code: SNI
Address: U.S. Navy, Pacific Missile Test Center, San Nicolas Island, CA	
Latitude: 33° 15' 24" N	Longitude: 119° 29' 09" W
UTM Northing: 3682.4 km	UTM Easting: 268.4 km
Elevation (above MSL): 122 m	

The San Nicolas Island site is under control of the U.S. Navy's Pacific Missile Test Center. The island is about 65 miles off the Southern California coast, so it is a good background station. The security storage office, Building 163, about 70 feet east of the island's meteorological office, was chosen as the SCAQS site. It is about 0.7 mile from the shore on the northeast side of the island. There is an airport on the island about 1.5 miles from the site. Figure 2-33 is a map of the island. No photographs are available due to the military operations on the island.

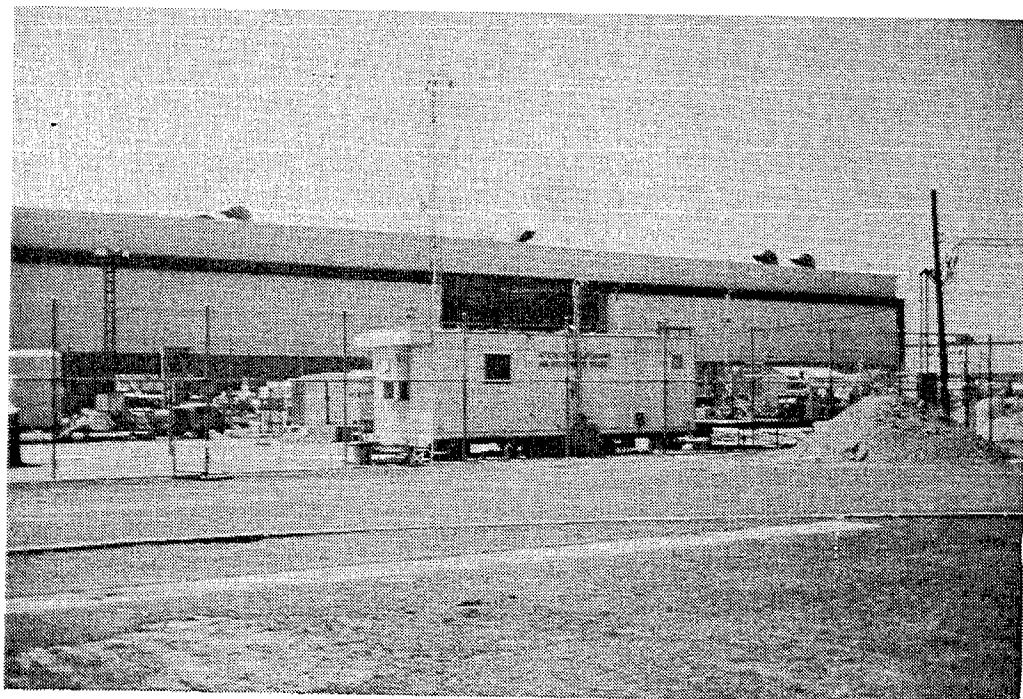


FIGURE 2-30. The Long Beach site with a McDonnell-Douglas aircraft hangar behind.

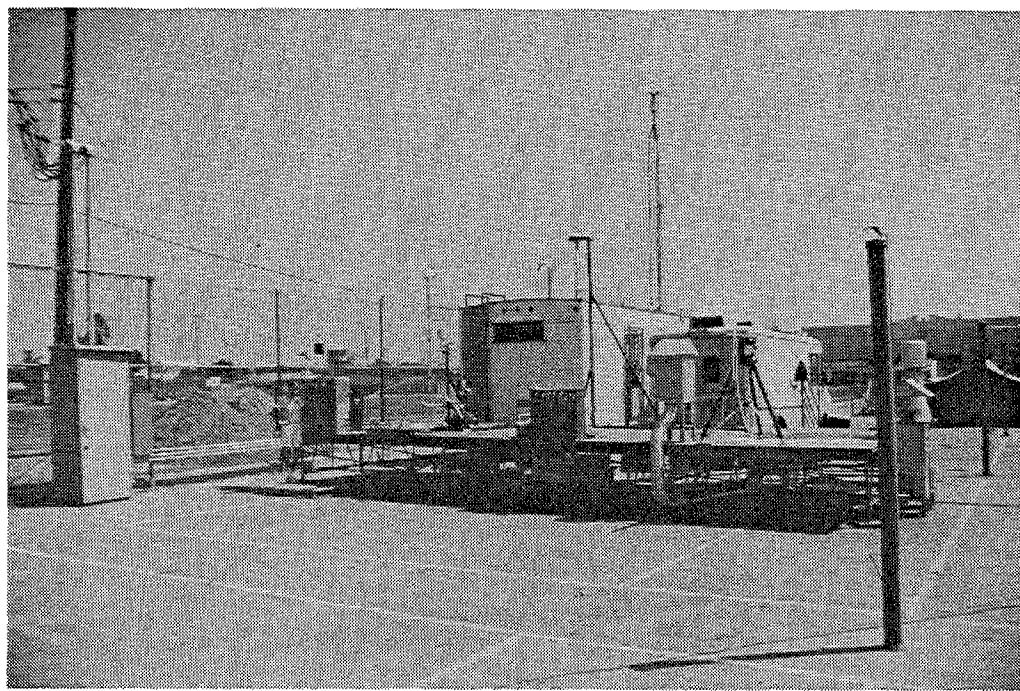


Figure 2-31. Sampler platform and trailer at the Long Beach site.

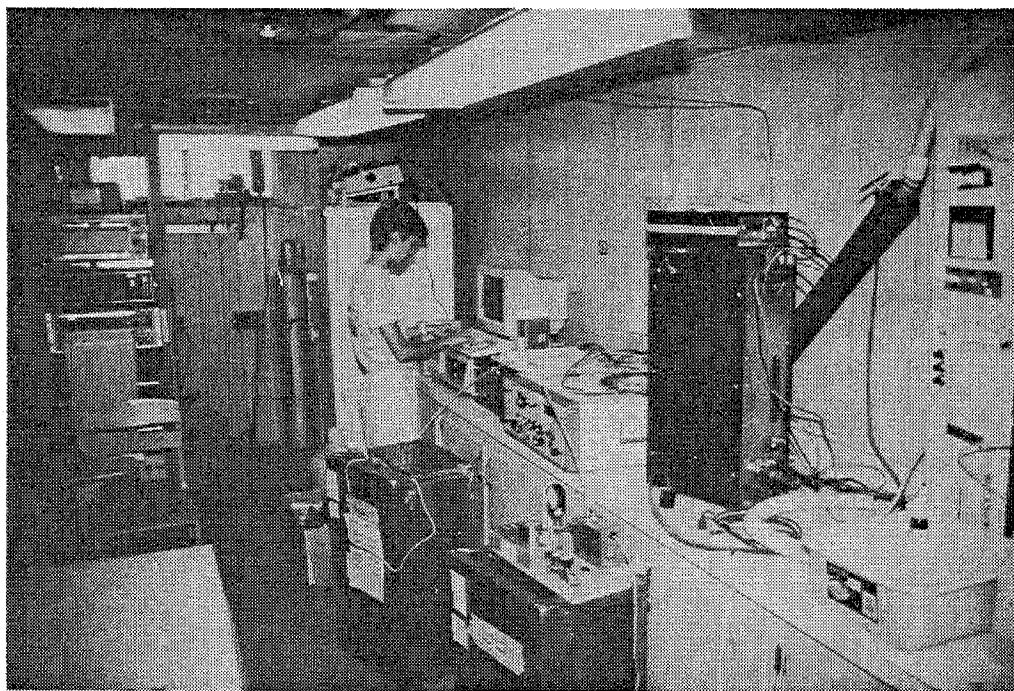


Figure 2-32. The SCAQS instruments and work area inside the headquarters trailer at the Long Beach site.

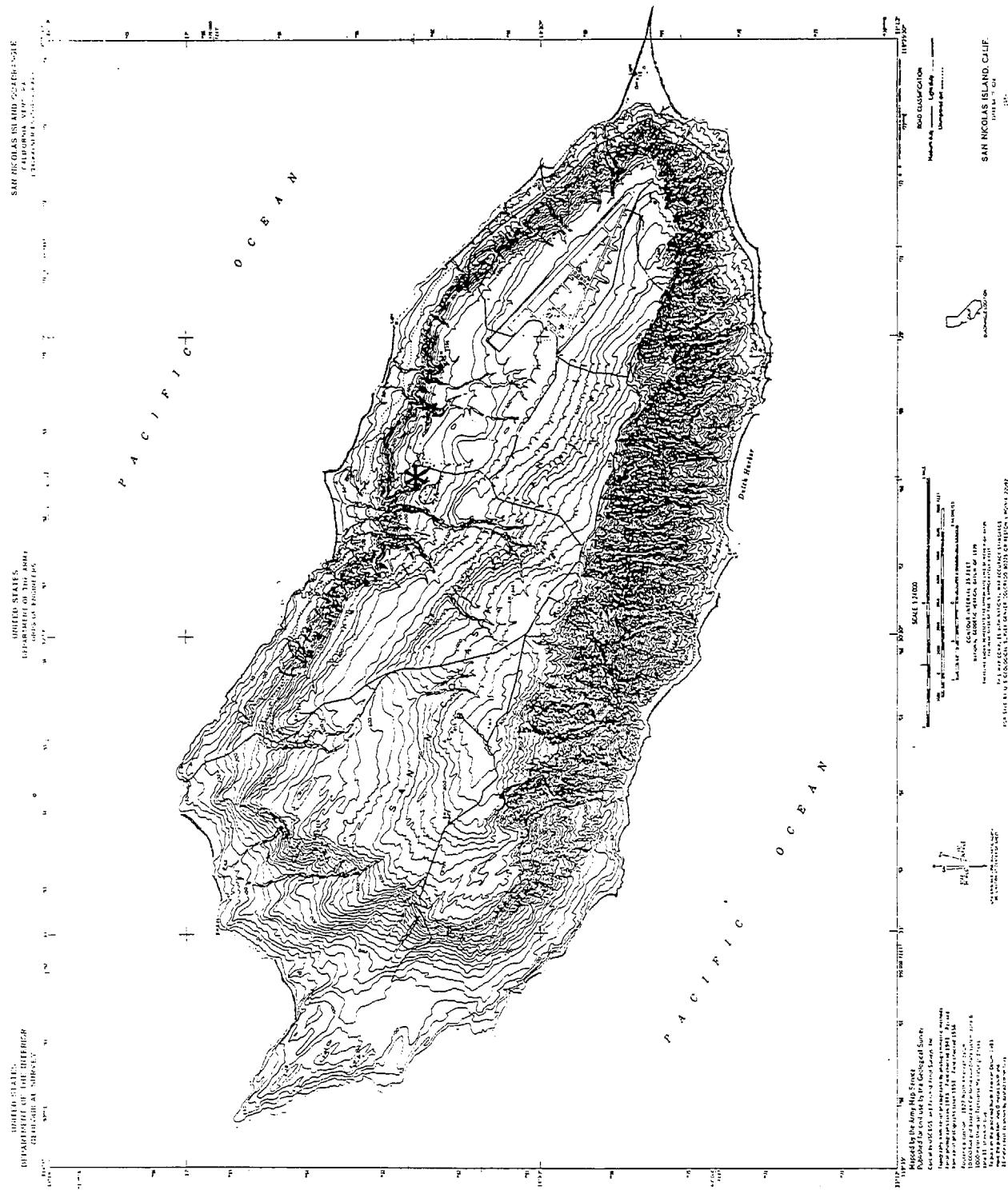


Figure 2-33. U.S.G.S. map of San Nicolas Island site.

Except for some military offices, mess halls, residences and the airport, the land is primarily undeveloped. There are only a few vehicles on the island. There are no significant air pollution sources on the island, except the airstrip and a small power station with five generators about five miles from the meteorological office. These are both downwind of the site. The wind on the island is strong and persistent, predominantly from the northwest at 8 to 10 knots (4 to 5 m/s). The terrain of the island is low rolling hills to a maximum height of just over 900 feet. The site has excellent air flow exposure.

AV installed, operated and maintained all SCAQS instruments, except the PAN GC, on the island. The PAN GC was the responsibility of DGA. Other SCAQS instruments on the island included gaseous analyzers ( $\text{NO}_2$ ,  $\text{O}_3$ , CO), wind speed and direction, temperature and dew point sensors, a PM-10 sampler, a SCAQS sampler, a nephelometer, a carbonyl sampler, a  $\text{C}_1\text{-C}_{10}$  hydrocarbon sampler and a high-volume sampler for collecting PAH samples.

AV provided all instruments except the following: the SCAQS sampler, which was obtained from the ARB; the nephelometer, which was obtained from the EPA; the carbonyl sampler, which was obtained from ENSR; the  $\text{C}_1\text{-C}_{10}$  hydrocarbon sampler, which was obtained from Biospherics; the PAN GC, which was obtained from DGA; and the high-volume sampler for PAH, which was obtained from UCR.

The sampling inlet was located on the southern corner of the roof of the security building, about 16.5 feet above ground and 3 feet above the roof. The PM-10 sampler was about 10 feet away, on the roof, with the inlet approximately 5 feet above the roof. The SCAQS sampler was placed on a table about 44 feet northeast of the security building, at the edge of a steep slope toward the ocean.

## 2.2 OTHER MEASUREMENTS

Many other measurements in addition to those discussed earlier were taken at Claremont, Long Beach, and Rubidoux in summer and at Long Beach and Los Angeles in fall. Detailed discussions of these measurements can be found in Hering et al. (1989). For completeness, however, all measurements at Claremont, Long Beach and Rubidoux in the summer are listed in Table 2-7 and those at Long Beach and Los Angeles in the fall in Table 2-8 (tables located at the end of this section). Location of each measurement at each site is presented in Figures 2-34 to 2-38.

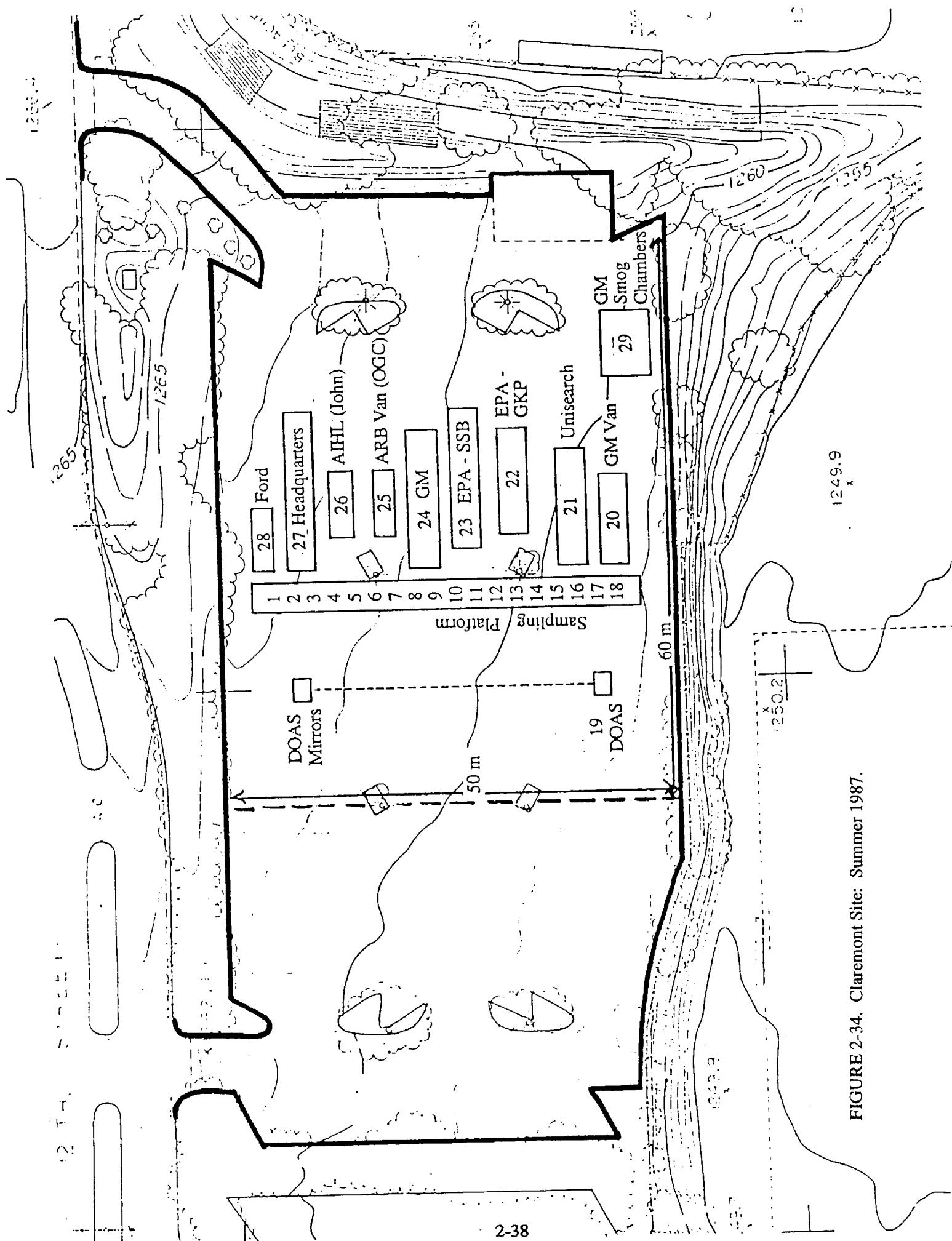


FIGURE 2-34. Claremont Site: Summer 1987.

Long Beach City College Track Field

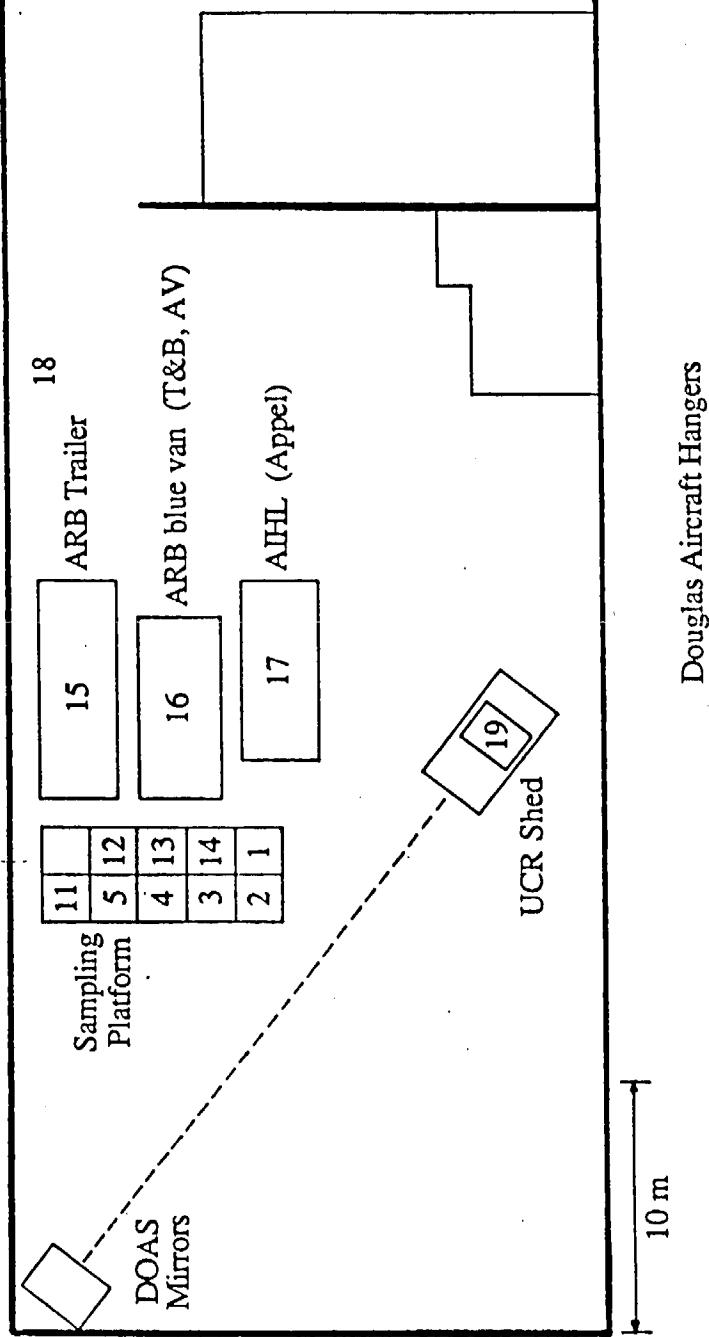
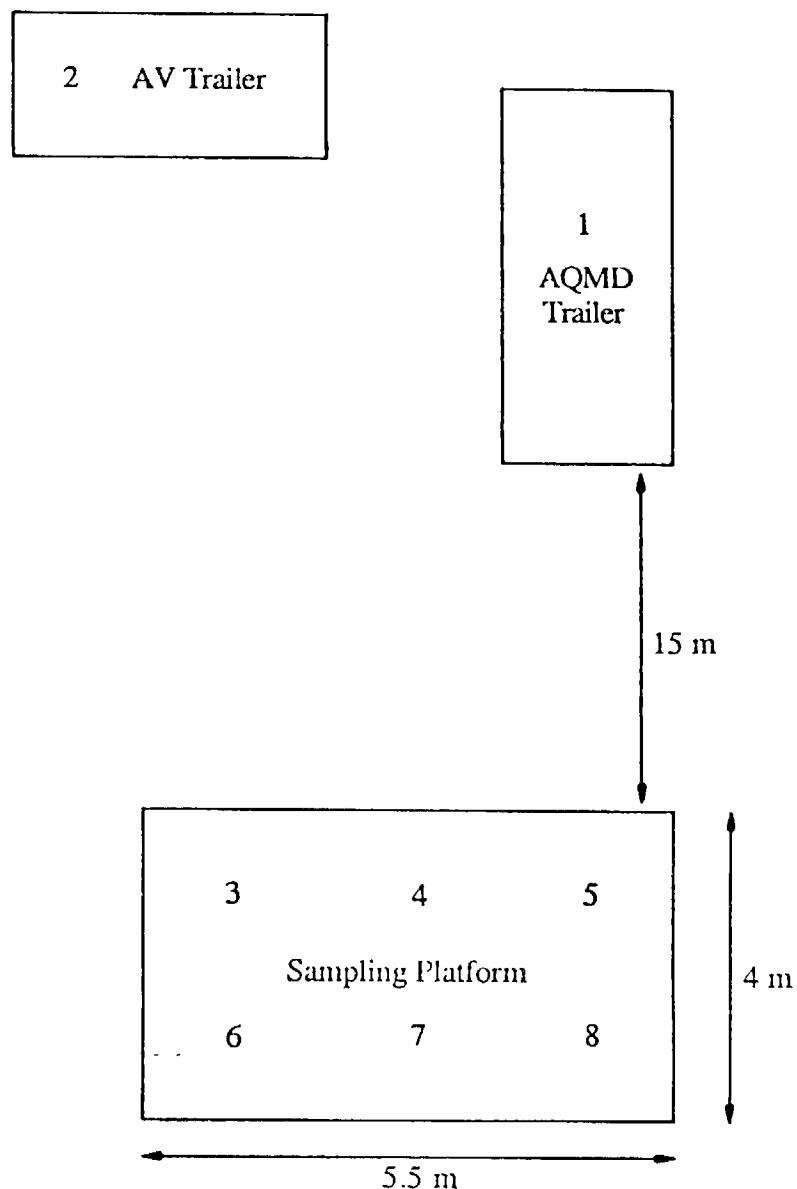


FIGURE 2-35. Long Beach Site: Summer 1987.



- 3 UCD Impactors and Cyclones
- 4 SCAQS Sampler
- 5 MOUDI
- 6 HiVols
- 7 AIHL - Berner Impactor
- 8 EPA - TFR

**FIGURE 2-36.** Rubidoux Site: Summer 1987.

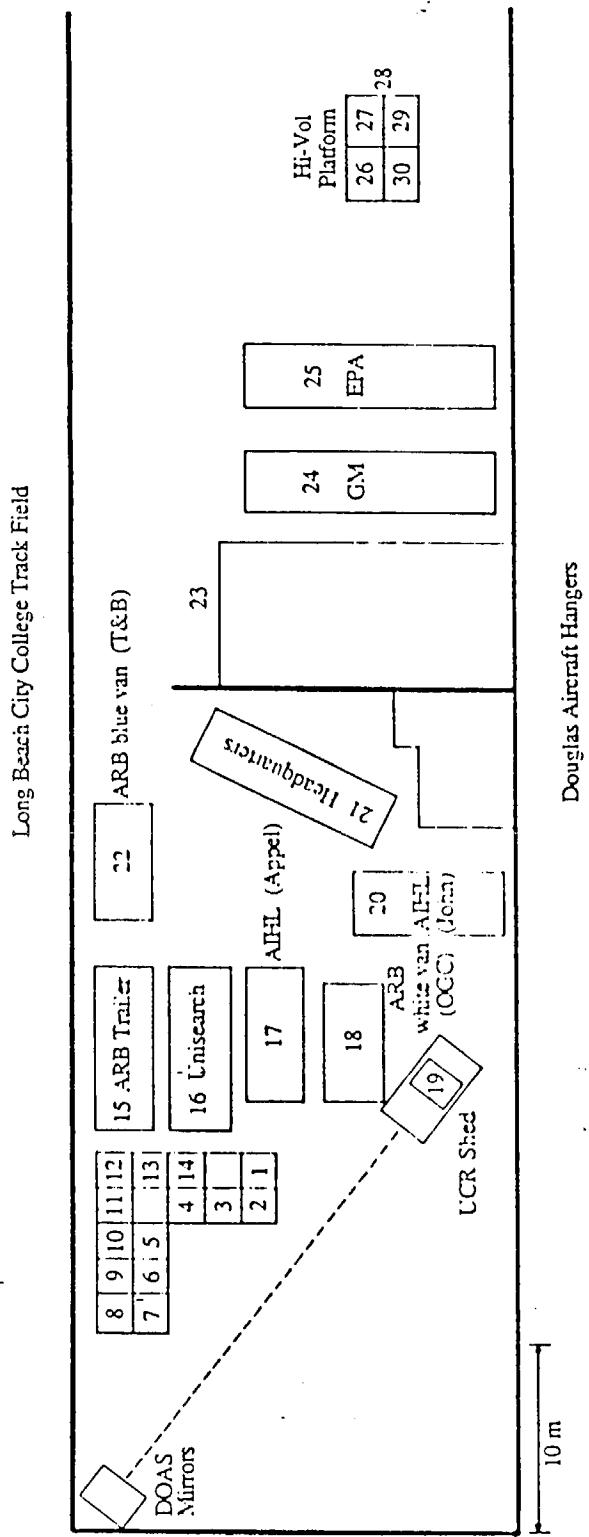
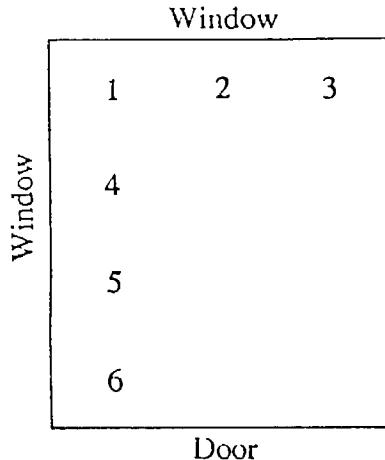


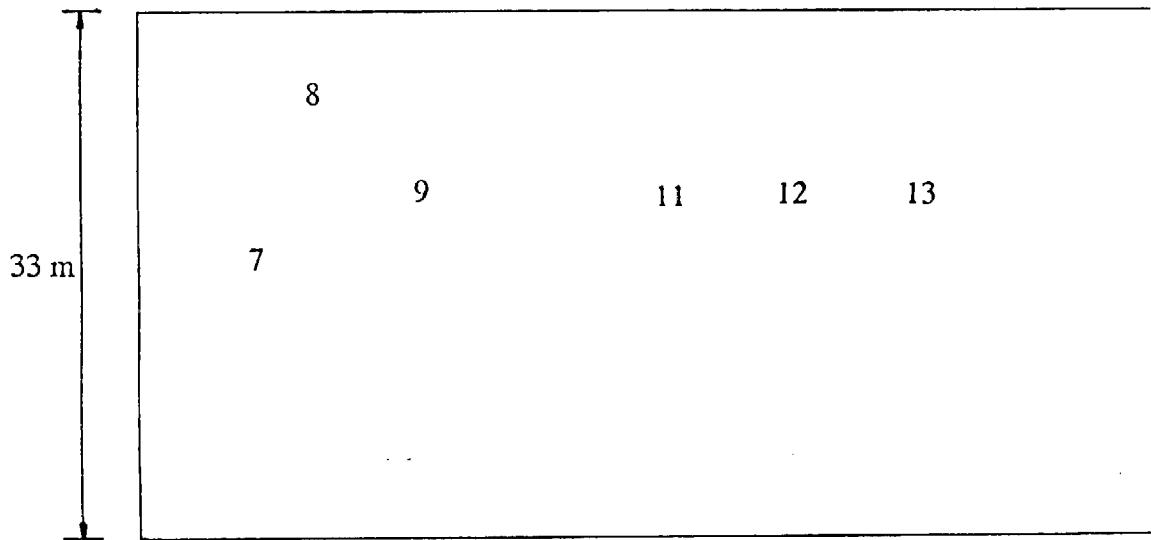
FIGURE 2-37. Long Beach Site: Fall 1987.

Inside AQMD Office



- 1 PAN, carbonyls
- 2 OPCs and EAA
- 3 Hydrocarbon and toxics canisters
- 4 AQMD instruments
- 5 AQMD instruments
- 6 UV Classifier

Roof (12 m above ground)



- 7 AQMD HiVols
- 8 GGC HiVols
- 9 UCD cyclone and impactor
- 10 EPA TFR sampler
- 11 UM MOUDI
- 12 SCAQS Sampler
- 13 AIHL Berner impactor

FIGURE 2-38. Downtown Los Angeles Site: Fall 1987.

TABLE 2-1. Instrumentation at B sites during summer.

Instruments	ANA	AZU	BUR	HAW	DLA	SNI	RUB	LB	CLA
SO <sub>2</sub> analyzer	X	X	X	X	X		X	X	X
NO/NO <sub>x</sub> analyzer	X	X	X	X	X	X	X	X	X
O <sub>3</sub> analyzer	X	X	X	X	X	X	X	X	X
CO analyzer	X	X	X	X	X	X	X	X	X
PM-10 samples	X	X	X	X	X	X	X	X	X
WD/WS sensors	X	X	X	X	X	X	X	X	X
Temperature sensors	X	X	X	X	X	X	X	X	X
Dew Point sensor	X	X	X	X	X	X	X	X	X
UV Radiometer					X		X	X	X
SCAQs sampler	X	X	X	X	X	X	X	X	X
Carbonyl sampler	X	X	X	X	X	X	X	X	X
C <sub>1</sub> -C <sub>10</sub> canisters	X	X	X	X	X	X	X	X	X
PAN GC	X	X	X	X	X	X	X	X	X
H <sub>2</sub> O <sub>2</sub> sampler					X		X	X	X
Nephelometer	X	X	X	X	X	X	X	X	X
OPC							X	X	X
Probe							X	X	X
EAA							X	X	X
MOUDI							X		X
Berner							X	X	X
DRUM							X	X	X
Air Toxics (Tedlar bag)					X		X	X	X
Air Toxics (canister)					X		X	X	X
Hi-Vol (PAH)						X			

TABLE 2-2. Instrumentation at B sites during fall.

Instruments	ANA	BUR	HAW	RUB	DLA	LB
SO <sub>2</sub> analyzer	X	X	X	X	X	X
NO/NO <sub>x</sub> analyzer	X	X	X	X	X	X
O <sub>3</sub> analyzer	X	X	X	X	X	X
CO analyzer	X	X	X	X	X	X
PM-10 samples	X	X	X	X	X	X
WD/WS sensors	X	X	X	X	X	X
Temperature sensors	X	X	X	X	X	X
Dew Point sensor	X	X	X	X	X	X
UV Radiometer				X	X	X
SCAQS sampler	X	X	X	X	X	X
Carbonyl sampler	X	X	X	X	X	X
C <sub>1</sub> -C <sub>10</sub> canisters	X	X	X	X	X	X
PAN GC	X	X	X	X	X	X
Nephelometer	X	X	X	X	X	X
OPC					X	X
Probe					X	X
EAA					X	X
MOUDI					X	X
Berner					X	X
DRUM					X	X
Air Toxics(Tedlar bag)					X	X
Air Toxics (canister)					X	X

TABLE 2-3. Organizations responsible for sampling and maintenance during summer.

Instrument	ANA	AZU	BUR	HAW	DLA	SNI	RUB	LB	CLA
Gaseous analyzers	AQMD	AQMD	AQMD	AQMD	AQMD	AV	AQMD	ARB	GMRL
PM-10 SAMPLER	AV	AQMD	AQMD	AV	AQMD	AV	AQMD	AV	AV
WS/WD sensors	AQMD	AQMD	AQMD	AQMD	AQMD	AV	AQMD	ARB	GMRL
T and DP sensors	AQMD	AQMD	AQMD	AQMD	AQMD	AV	AQMD	ARB	GMRL
UV Radiometer	--	--	--	--	AV	--	AV	AV	GMRL
Nephelometer	AQMD	AQMD	AQMD	AQMD	AQMD	AV	AQMD	AV	AV
C <sub>1</sub> -C <sub>10</sub> sampler	AV	AV	AV	AV	AV	AV	AV	AV	AV
PAN GC	DGA	DGA	DGA	DGA	DGA	DGA	DGA	DGA	DGA
Carbonyl sampler	AV	AV	AV	AV	AV	AV	AV	AV	AV
H <sub>2</sub> O <sub>2</sub> sampler	--	--	--	--	AV	--	AV	AV/EMSI	AV/EMSI
SCAQs sampler	AV	AV	AV	AV	AV	AV	AV	AV	AV
EAA/OPC/probe	--	--	--	--	--	--	AV	AV	AV
MOUDI	--	--	--	--	--	--	UM	--	UM
Berner	--	--	--	--	--	--	AIHL	AIHL	AIHL
DRUM	--	--	--	--	--	--	UCD	UCD	UCD
Air toxics (Tedlar bags)	--	--	--	--	AV	--	AV	AV	AV
Air toxics (canisters)	--	--	--	--	AV	--	AV	AV	AV
HiVol (PAH)	--	--	--	--	--	AV	--	--	--

AQMD = South Coast Air Quality Management District

AIHL = Air and Industrial Hygiene Laboratories

AV = AeroVironment Inc.

EMSI = Environmental Monitoring and Sciences, Inc.

UCD = University of California, Davis

ARB = California Air Resources Board

DGA = Daniel Grosjean and Associates

GMRL = General Motors Research Laboratories

UM = University of Minnesota

TABLE 2-4. Organizations responsible for sampling and maintenance during fall.

Instruments	ANA	BUR	HAW	RUB	DLA	LB
Gaseous analyzers	AQMD	AQMD	AQMD	AQMD	AQMD	ARB
PM-10 sampler	AV	AQMD	AV	AQMD	AQMD	AV
WS/WD sensors	AQMD	AQMD	AQMD	AQMD	AQMD	ARB
T and DP sensors	AQMD	AQMD	AQMD	AQMD	AQMD	ARB
UV Radiometer	--	--	--	AV	AV	AV
Nephelometer	AQMD	AQMD	AQMD	AQMD	AQMD	AV
C <sub>1</sub> C <sub>10</sub> sampler	AV	AV	AV	AV	AV	AV
PAN GC	DGA	DGA	DGA	DGA	DGA	DGA
Carbonyl sampler	AV	AV	AV	AV	AV	AV
SCAQs sampler	AV	AV	AV	AV	AV	AV
EAA/OPC/Probe	--	--	--	--	AV	AV
MOUDI	--	--	--	--	UM	UM
Berner	--	--	--	--	AIHL	AIHL
DRUM	--	--	--	--	UCD	UCD
Air Toxics (Tedlar bags)	--	--	--	--	AV	AV
Air Toxics (canisters)	--	--	--	--	AV	AV

TABLE 2-5. Instruments procured and maintained by AV during summer SCAQS.

	Instrument Name	Manufacturer, Model & Serial No.	Owner	Site	Used Period From - To
1)	EAA	TSI Model 3030 Serial No. 97	EMSI	RUB	6/10 to 9/5/87
2)	EAA	TSI Model 3030 Serial No. 80	EPA	LB	6/10 to 9/5/87
3)	EAA	TSI Model 3030 Serial No. 58	STI	CLA	6/10 to 9/5/87
4)	EAA	TSI Model 3030 Serial No. 196	SCE		spare for back-up
5)	OPC	Climet Model 208 Serial No. 76-065	RLAM*	RUB	6/10 to 9/5/87
6)	OPC	Climet Model 208 Serial No. 76-148	UCR	CLA	6/10 to 9/5/87
7)	OPC	Climet Model 208 Serial No. 78-060	STI/EPA	LB	6/10 to 9/5/87
8)	OPC	Climet Model 208 Serial No 79-034	SCE		spare for back-up
9)	PROBE	PMS, Knollenberg s/n;1118-0679-18	STI/EPA	RUB	6/10 to 9/5/87
10)	PROBE	PMS, Knollenberg s/n;9835-0387-85	ARB	CLA	6/10 to 9/5/87
11)	PROBE	PMS, Knollenberg s/n:9835-0387-86	ARB	LB	6/10 to 9/5/87
12)	Nephelometer	MRI Model 1560 s/n: 128	EPA	spare	5/19 to 8/1/87
				SNI	8/1 to 9/5/87

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TABLE 2-5. (continued)

13)	Nephelometer	MRI Model 1561 s/n: 114	EPA	SNI	5/19 to 8/1/87
				spare	8/1 to 9/5/87
14)	Nephelometer	MRI Model 1561 s/n: 121	EPA	CLA	5/19 to 9/5/87
15)	Nephelometer	MRI Model 1567 s/n: 142	EPA	DLA	5/19 to 9/5/87
16)	Nephelometer	MRI Model 1561 s/n: 185	Hering	RUB	5/29 to 9/5/87
17)	Nephelometer	MRI Model 1561 s/n: 118	NWC	LB	5/29 to 9/5/87
18)	Nephelometer	MRI Model 1562 s/n: 147	NWC	HAW	5/29 to 9/5/87
19)	Nephelometer	MRI Model 1562 s/n: 150	NWC	ANA	5/29 to 9/5/87
20)	Nephelometer	MRI Model 1562 s/n: 149	NWC	BUR	5/29 to 9/5/87
21)	Nephelometer	MRI Model 1567 s/n: 193	AV	AZU	5/29 to 9/5/87
22)	NO-NOx	ML Model 8440 s/n: 1018	ARB	SNI	6/10 to 9/5/87
23)	CO	Dásibi Mod.3003 s/n: 300901	ARB	SNI	6/10 to 9/5/87
24)	O3	Dasibi Mod.1003-AH s/n: 1116	ARB	SNI	6/10 to 8/9/87
25)	O3	Dasibi Mod.1003-AH s/n: 2416	AV	SNI	8/10 to 9/5/87
26)	UV analyzer	Model Eppley 47801 s/n:13337	ARB	LB	6/10 to 9/5/87
27)	UV analyzer	Model Eppley TRUV s/n: 1120	AV	RUB	6/12 to 9/5/87

TABLE 2-5. (continued)

28)	UV analyzer	Model Eppley UV s/n: 10747	EPA	DLA	6/25 to 9/5/87
29)	Calibrator	ML Model:8500  s/n: 1042	AV	SNI	6/10 to 9/5/87
30)	Meteorlogical Instruments	MET Model:1002 s/n: 544	AV	SNI	6/10 to 9/5/87
31)	Data logger	Sum-x Model:405 s/n: 181	AV	SNI	6/10 to 9/5/87
32)	Chart Recorders	MS Model 413C s/n:86350056, 86070034 86035009	AV	SNI	6/10 to 9/5/87
33)	Printer	Epson FX-800 s/n: 10002618	AV	SNI	6/10 to 9/5/87
34)	Const. Voltage Transformer	Sola Electric Model LR 44047 s/n:23-25-175	AV	SNI	6/10 to 9/5/87
35)	PM 10 (PAH)	Andersen Model 321-A s/n :216	UCR	SNI	6/10 to 9/5/87
36)	Orifice cal.	Andersen Model 305-25 s/n: 8052186	AV	SNI	6/10 to 9/5/87
37)	Met Tower	Tri-X C27-3 s/n: 5281	AV	SNI	6/10 to 9/5/87
38)	PM-10	Andersen Model 321-A s/n: 142	AV	SNI	6/10 to 9/5/87
39)	PM-10	Andersen Model 321-A S/N: 2237	ARB	ANA	6/10 to 9/5/87
40)	PM-10	Andersen Model 321-A S/N: 1170	ARB	HAW	6/10 to 9/5/87
41)	PM-10	Andersen Model 321-A s/n: 2047	EPA	LB	6/10 to 9/5/87
42)	PM-10	Andersen Model 321-A s/n: 7197	STI	CLA	6/10 to 9/5/87

TABLE 2-5. (continued)

43)	PC/printer	Epson FX-800 s/n: SCAQS1	ARB	RUB	6/10 to 9/5/87
44)	PC/printer	Epson FX-800 s/n: SCAQS3	ARB	LB	6/10 to 9/5/87
45)	PC/printer	Epson FX-800 s/n: SCAQS4	ARB	CLA	6/10 to 9/5/87
46)	SCAQS Sampler	AeroVironment s/n:1	ARB	DLA	6/12 to 9/5/87
47)	SCAQS Sampler	AeroVironment s/n:2	ARB	HAW	6/12 to 9/5/87
48)	SCAQS Sampler	AeroVironment s/n:3	ARB	ANA	6/12 to 9/5/87
49)	SCAQS Sampler	AeroVironment s/n:4	ARB	SNI	6/12 to 9/5/87
50)	SCAQS Sampler	AeroVironment s/n:5	ARB	RUB	6/12 to 9/5/87
51)	SCAQS Sampler	AeroVironment s/n:6	ARB	BUR	6/12 to 9/5/87
52)	SCAQS Sampler	AeroVironment s/n:7	ARB	AZU	6/12 to 9/5/87
53)	SCAQS Sampler	AeroVironment s/n:8	ARB	LB	6/12 to 9/5/87
54)	SCAQS Sampler	AeroVironment s/n:GM	GM	CLA	6/12 to 9/5/87
55)	SCAQS Sampler	AeroVironment s/n:10	ARB	AV	spare for back-up
56)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 1	OG	BUR AZU	6/12 to 9/1/87 9/ 1 to 9/5/87
57)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 2	OG	ANA	6/12 to 9/5/87
58)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 3	OG	SNI	6/12 to 9/5/87
59)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 4	OG	LB	6/12 to 9/5/87

TABLE 2-5. (continued)

60)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 5	OG	AZU spare	6/12 to 9/1/87 9/ 1 to 9/5/87
61)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 6	OG	RUB	6/12 to 9/5/87
62)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 7	OG	CLA	6/12 to 9/5/87
63)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 8	OG	DLA BUR	6/12 to 9/1/87 9/ 1 to 9/5/87
64)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 9	OG	HAW	6/12 to 9/5/87
65)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n: 10	OG	spare DLA	6/12 to 9/1/87 9/ 1 to 9/5/87
66)	Air Toxics	Biospherics s/n: 1	OG	RUB	6/12 to 9/5/87
67)	Air Toxics	Biospherics s/n: 2	OG	LB	6/12 to 9/5/87
68)	Air Toxics	Biospherics s/n: 3	OG	CLA	6/12 to 9/5/87
69)	Air Toxics	Biospherics s/n: 4	OG	DLA	6/12 to 9/5/87
70)	Air Toxics	Biospherics s/n: 5	OG	spare	6/12 to 9/5/87

TABLE 2-6. Instruments Procured and Maintained by AV During Fall SCAQS

	Instrument Name	Manufacturer & Model	Owner	Site	Used Period From - To
1)	EAA	TSI Model 3030 Serial No. 97	EMSI	LB	11/5 to 12/11/87
2)	EAA	TSI Model 3030 Serial No. 80	EPA	spare	
3)	EAA	TSI Model 3030 Serial No. 58	STI	DLA	11/5 to 12/11/87
4)	OPC	Climet Model 208 Serial No. 76-065	RLAM*	LB	11/5 to 12/11/87
5)	OPC	Climet Model 208 Serial No. 76-148	UC Riverside	DLA spare	11/5 to 11/30/87 12/1 to 12/11/87
6)	OPC	Climet Model 208 Serial No. 78-060	STI/EPA	spare DLA	11/5 to 11/30/87 12/1 to 12/11/87
7)	PROBE	PMS, Knollenberg s/n:1118-0679-18	STI/EPA	LB	11/5 to 12/11/87
8)	PROBE	PMS, Knollenberg s/n:9835-0387-85	ARB	DLA spare	11/5 to 11/30/87 12/1 to 12/11/87
9)	PROBE	PMS, Knollenberg s/n:9835-0387-86	ARB	spare DLA	11/5 to 12/11/87 12/1 to 12/11/87
10)	Nephelometer	MRI Model 1560 s/n: 128	EPA	LB	11/5 to 12/11/87
11)	Nephelometer	MRI Model 1561 s/n: 121	EPA	RUB	11/5 to 12/11/87
12)	Nephelometer	MRI Model 1561 s/n: 118	NWC	BUR	11/5 to 12/11/87
13)	Nephelometer	MRI Model 1562 s/n: 147	NWC	HAW	11/5 to 12/11/87

\* Rancho Los Amigos Medical

TABLE 2-6. (continued)

14)	Nephelometer	MRI Model 1562 s/n: 150	NWC	ANA	11/5 to 12/11/87
15)	Nephelometer	MRI Model 1562 s/n: 149	NWC	DLA	11/5 to 12/11/87
16)	Nephelometer	MRI Model 1567 s/n: 142	EPA	spare	
17)	Nephelometer	MRI Model 1567 s/n: 193	AV	spare	
18)	UV analyzer	Model Eppley 47801 s/n: 13337	ARB	LB	11/5 to 12/11/87
19)	UV analyzer	Model Eppley TRUV s/n: 18808	AV	RUB	11/5 to 12/11/87
20)	UV analyzer	Model Eppley UV s/n: 10747	EPA	DLA	11/5 to 12/11/87
21)	PM-10	Andersen Model 321-A s/n: 216	UCR	spare	11/5 to 12/11/87
22)	PM-10	Andersen Model 321-A S/N: 1170	ARB	ANA	11/5 to 12/11/87
23)	PM-10	Andersen Model 321-A S/N: 1171	ARB	HAW	11/5 to 12/11/87
24)	PM-10	Andersen Model 321-A s/n: 1241	ARB	LB	11/5 to 12/11/87
25)	PM-10	Andersen Model 321-A s/n: 7197	STI	spare	
26)	PM10	Andersen Model 321-A s/n: 2047	EPA	spare	
27)	PC/printer	Epson FX-800 s/n: SCAQS1		ARB	LB11/5 to 12/11/87
28)	PC/printer	Epson FX-800 s/n: SCAQS4		ARB	DLA11/5 to 12/11/87

TABLE 2-6. (continued)

29)	PC/printer	Epson FX-800 s/n: SCAQS3	ARB	spare	
30)	PC	Epson FX-800 s/n: SCAQS2	ARB	spare	
31)	SCAQS Sampler	AeroVironment s/n:1	ARB	DLA	11/5 to 12/11/87
32)	SCAQS Sampler	AeroVironment s/n:2	ARB	HAW	11/5 to 12/11/87
33)	SCAQS Sampler	AeroVironment s/n:3	ARB	ANA	11/5 to 12/11/87
34)	SCAQS Sampler	AeroVironment s/n:4	ARB	spare	
35)	SCAQS Sampler	AeroVironment s/n:5	ARB	RUB	11/5 to 12/11/87
36)	SCAQS Sampler	AeroVironment s/n:6	ARB	BUR	11/5 to 12/11/87
37)	SCAQS Sampler	AeroVironment s/n:7	ARB	spare	
38)	SCAQS Sampler	AeroVironment s/n:8	ARB	LB	11/5 to 12/11/87
39)	SCAQS Sampler	AeroVironment s/n:9	ARB	spare	
40)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-1	OG	BUR	11/5 to 12/11/87
41)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-2	OG	ANA	11/5 to 12/11/87
42)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-3	OG	LB	11/5 to 12/11/87
43)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-4	OG	RUB	11/5 to 12/11/87
44)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-5	OG	DLA	11/5 to 12/11/87
45)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-6	OG	HAW	11/5 to 12/11/87
46)	C <sub>1</sub> -C <sub>10</sub>	Biospherics s/n:R-7	OG	spare	
47)	Air Toxics	Biospherics s/n: 4	OG	DLA	11/5 to 12/11/87
48)	Air Toxics	Biospherics s/n: 5	OG	LB	11/5 to 12/11/87
49)	Air Toxics	Biospherics s/n: 6	OG	spare	

TABLE 2-7. Summer measurements at Claremont, Long Beach and Rubidoux.

Group(s)	Plt	Site	Network	Measurement	No. of Samples	Sitet Loc	Non-int.	Sampling Times(PDT)††	Parameters
SCAQOS	B	Kowalski	ARB-HS	Monitor Labs #8840 NOx/NOx MRI #1561 Nephelometer (heated inlet)	CL	27	cont.*	-	NO, NOx Particle light scattering coefficient
AV	Chan	Chan/Boppe	AV/QMD	Andersen #321-A SSI (PM-10) Hivol	CL	27	hourly	cont.*	PM-10 mass, sulfate and nitrate
AV/EMSI	Chan/Kesler	CHAN/KESLER	AV/EMSI	SCAQOS sampler	CL	1	0	1	Aerosol chemistry, HNO <sub>3</sub> , NH <sub>3</sub> , SO <sub>2</sub>
AV/ERT	Chan/Wright	CHAN/WRIGHT	ARB-HS	DNPH cartridges: carbonyls	CL	4	0	5	Carbonyls
AV/Bio	Kowalski	CHAN/RASMUSSEN	AV/Bio	ARB Tedlar bags for toxics	CL	27	0	61(hr)	Speciated air toxics
DGA	Grosjean	GROSJEAN	Grosjean	Biospherics toxics canister	CL	27	0	1	Air toxics
EMSI	Lev-On	LEV-ON	H2O2 Impingers	PAN by GC, electron capture	CL	27	0	0-24 PST	PAN
GM	Wolff	WOLFF	Monitor Labs #8840: NO, NOx	H2O2 Impingers	CL	27	0	0-24 PST	H2O2
GM	Wolff	WOLFF	Climatronics WS/WD, T, DP, sigma	Monitor Labs #8840: NO, NOx	CL	8	cont.*	-	NO, NOx
GM	Wolff	WOLFF	Dasibi 1003AH: O <sub>3</sub>	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	WS/WD, T, DP, sigma
GM	Wolff	WOLFF	Dasibi 3003: CO	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	O <sub>3</sub>
GM	Wolff	WOLFF	Eppley total solar radiation pyranometer	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	CO
GM	Wolff	WOLFF	Eppley total UV radiometer	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	Total solar radiation
GM	Wolff	WOLFF	Melby SA 285: SO <sub>2</sub>	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	UV radiation
GM	Wolff	WOLFF	Monitor Labs 8410: O <sub>3</sub>	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	SO <sub>2</sub>
GM	Wolff	WOLFF	NRI #1550 Nephelometer (Waggoner mod., heated)	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	O <sub>3</sub>
GM	Wolff	WOLFF	T1-T2,T3, platinum temperature probes	Climatronics WS/WD, T, DP, sigma	CL	24	cont.*	-	Particulate scattering coefficient
SCAQOS	B+	Site	Aerosol Size Distributions	Berner impactor for inorganics	CL	6	0	4	Temperature at three heights
AHL-J	John	CHAN	AV	Climet 208 OPC	CL	27	hourly	cont.*	Na, Cl, SO <sub>4</sub> , NO <sub>3</sub> , NH <sub>4</sub> , OH size distribution (8 cuts 0.06-8μm)
AV	Chan	CHAN	AV	PMS LASX probe	CL	27	hourly	cont.*	0.5-7 μm optical size distributions
AV	Chan	CHAN	UCD	TSI #3030 Electrical Aerosol Analyzer	CL	27	hourly	cont.*	0.1-1 μm optical size distributions
UCD	Carilli	CHAN/ELLIS	UCD	UCD drum impactor for PIXE (FAST)	CL	5	6	6	0.0056 - 0.56 μm Stokes size distributions
UCD	Friedlander/Main	CHAN/ELLIS	UCD	LPi/Ph	CL	9	0	1/3	Size resolved elements by PIXE (FAST)
UM	McMurtry	CHAN/ELLIS	UM	MOUDI for OC, EC	CL	7	0	4	Pb distribution (0.05, 0.12, 0.26, 0.5, 1.2 μm)
Meteorological Measurements	Ford	Adams	WS/WD	WS/WD	CL	28	0	cont.*	OC, EC, size resolved.
GM	Wolff	WOLFF	Acoustic sounder	WS/WD	CL	24	cont.*	-	Support for spectrophane, data will not be reported
Reactive Gaseous Species	ARB-HS	Kowalski	ARB-HS	Modified Dasibi 1008 for NO <sub>2</sub>	CL	27	cont.	-	NO <sub>2</sub>
AV/EPA-SSB	Chan/Knapp	CHAN/KNAPP	AV/EPA-SSB	C1-C12 Biospherics canisters	CL	27	0	61(hr)	Speciated C2-C12 hydrocarbons
DGA	Grosjean	GROSJEAN	DGA	Impingers (H <sub>2</sub> O, chloroform, 0.16L/m)	CL	2	0	6	Organic acids
DGA	Grosjean	GROSJEAN	DGA	KOH cartridges (1.5L/m)	CL	2	0	6	Organic acids
EMSI	Lev-On	LEV-ON	EMSI	Teflon filter (30 L/m)	CL	2	0	6	Organic acids
EPA-GKP	Lonneman/Ellenson	CHAN/ELLIS	EPA-GKP	L Ar trap, aldehydes, ketones	CL	27	0	6	Aldehydes and ketones
EPA-GKP	Lonneman/Ellenson	CHAN/ELLIS	EPA-GKP	Aldehydes (DNPH SEP packs)	CL	22	3	3	Aldehydes (by HPLC analysis)
EPA-GKP	Lonneman/Ellenson	CHAN/ELLIS	EPA-GKP	HC canisters	CL	22	3	3	C1-C12 hydrocarbons by GC analysis of canisters
EPA-GKP	Lonneman/Ellenson	CHAN/ELLIS	EPA-GKP	Unisearch formaldehyde	CL	22	cont.*	-	NO <sub>x</sub> less HNO <sub>3</sub> (removed by Nylon prefilter)
GGC	Gordon	GORDON	GGC	GGC carbon cartridges for alcohols	CL	22	cont.*	-	PAN
GM	Wolff	WOLFF	GM	Beckman 40: total hydrocarbons (including CH <sub>4</sub> )	CL	3	0	5	Ethanol, methanol
UGR	Winer	WINER	UGR	DOAS for NO <sub>3</sub> , HNO <sub>2</sub> , HCHO	CL	24	cont.*	-	Total hydrocarbons
UD	Sternman	STERDMAN	UD	UD chemical amplification for RO-	CL	19	0	cont.*	NO <sub>2</sub> , HNO <sub>2</sub> , HCHO
UD	Sternman	STERDMAN	UD	UD GC: luminol detector for PAN	CL	16	cont.*	-	Free radicals
Uni	Mackay	MACKAY	Uni	UD luminol detection of HNO <sub>3</sub>	CL	16	cont.*	-	PAN
Uni	Mackay	MACKAY	Uni	Unisearch formaldehyde	CL	21	0	cont.*	Nitric acid
Uni	Mackay	MACKAY	Uni	Unisearch H2O2	CL	21	cont.*	-	HCHO
Uni	Mackay	MACKAY	Uni	Unisearch HNO <sub>3</sub>	CL	21	0	-	H2O2
Aerosol Measurements	ARB-HS	Kowalski	ARB-HS	Unisearch Luminox	CL	21	cont.*	-	HNO <sub>3</sub>
GM	Croes	CROES	GM	RAC tape sampler	CL	27	24	24	NO <sub>2</sub> , HCHO
EPA-Sacr.	Knapp	KNAPP	EPA-Sacr.	MDA BAM sampler (Beta gauge)	CL	11	24	24	Filter reflectance
EPA-SSB	Knapp	KNAPP	EPA-SSB	3 quartz in series (4.7mm)	CL	12	0	2	PM-10 mass, hourly averages
EPA-SSB	Knapp	KNAPP	EPA-SSB	Open faced 47mm quartz	CL	12	2	00, 12	OC, EC
EPA-SSB	Knapp	KNAPP	EPA-SSB	Hivol: 12 hour samples	CL	13	2	2	OC, EC
GCC	Gordon	GORDON	GCC	Hivol: contemporary carbon (C14)	CL	13	multiday	00, 12	perhaps specialized HC
GM	Wolff	WOLFF	GM	SSI Hivol	CL	3	0	1	C12/C14 ratios
GM	Hunzicker	HUNZICKER	GM	SCAQOS sampler	CL	8	2	0	Mulagenicity
OCC	Hunzicker	HUNZICKER	OCC	Single port for Pb/Br	CL	7	0	06, 18	Aerosol chemistry, HNO <sub>3</sub> , NH <sub>3</sub> , SO <sub>2</sub>
OCC	Hunzicker	HUNZICKER	OCC	Cumulative OC, EC distribution	CL	7	1	00-05	Pb, Br
									Cumulative OC, EC (0.3, 0.5, 1, 2.5, 10)

TABLE 2-7. (continued)

Group/site	PI	Measurement	No. of Samples		Sampling Times (PDT)††	Parameters
			Site	Loc†	No. Int.	Inten.
Hunzicker	Hunzicker	Continuous sulfate	CL	25	~12	~12
OGC	UCD	In-situ carbon	CL	5	5	semi-cont.*
UCD	Carilli	IMPROVE cyclone; glass denuder, nylon filter	CL	5	5	01, 06, 10, 14, 18
UCD	Carilli	IMPROVE cyclone; K2CO3 impregnated filter	CL	5	5	01, 06, 10, 14, 18
UCD	Carilli	IMPROVE cyclone; nylon filter	CL	5	5	01, 06, 10, 14, 18
UCD	Carilli	IMPROVE cyclone; quartz filter	CL	5	5	01, 06, 10, 14, 18
UCD	Carilli	IMPROVE cyclone; Teflon filter	CL	5	5	01, 06, 10, 14, 18
UCD	Friedlander	Dichotomous carbon	CL	9	0	01, 06, 10, 14, 18
UCLA-2	Friedlander	Dichotomous mass, XRF	CL	9	0	01, 06, 10, 14, 18
UCLA-2	Friedlander	Dichotomous NO3, SO4	CL	9	0	01, 06, 10, 14, 18
UCLA-1	Allen	LPI/FTIR	CL	10	0	Aerosol functional groups distribution (0.05,0.075,0.12,0.2,0.5,1,2µm)
UCLA-1	Allen	LPI/NO3	CL	10	0	Nitrate distribution (0.05,0.075,0.12,0.25,0.5,1,2µm)
UCLA-1	Allen	LPI/S	CL	10	0	Aerosol sulfur distribution (0.05,0.075,0.12,0.26,0.5,1,2µm)
UCR	Atkinson	HVol for PAH	CL	11	0	PAHs, nitro & dimictro PAHs (gc-ms)
UCR	Atkinson	HVol with PUF	CL	11	0	PAHs, nitro & dimictro PAHs (gc-ms)
UCR	Atkinson	PNA-10 HVol for PAH	CL	16	0	PAHs, nitro & dimictro PAHs (gc-ms)
UM	McMurtry,	MOUDI for mass	CL	7	0	Size resolved mass
UV	Reischl,	Classifier for fine dV/dDp	CL	26	cont.*	dN/dlogDp 0.003-0.15 µm
ARB-HS	Kowalski	Denuder difference for HNO3, NO3-CADMP-DRI acid sampler #1	CL	13	0	HNO3, fine NO3-
DRH	Bowen	CADMP-DRI acid sampler #2	CL	18	1	PM-10 & PM-2.5 mass, SO4, NO3, Cl, NH4, Mg, K, Na, Ca, SO2, NO2, NH3, HNO3
DRH	Bowen	Annular denuder (on root)	CL	18	1	PM-10 & PM-2.5 mass, SO4, NO3, Cl, NH4, Mg, K, Na, Ca, SO2, NO2, NH3, HNO3
EPA-GKP	Ellerison	Annular denuder (on root)	CL	22	0	NO2, NO3, SO4
EPA-GKP	Ellerison	Annular denuder (on root)	CL	22	1	NO2, NO3, SO4
EPA-GKP	Ellerison	Trans flow Rir [Cycl.-TFR(NH3)-T-N(CA)TEA]	CL	22	2	NO2, NO3, SO4
EPA-SSB	Knapp	Trans flow Rir [Cycl.-TFR(NH3)-T-N(CA)TEA]	CL	12	5	SO4, NO3, NH3, NH4, SO2, NO2
EPA-SSB	Knapp	Trans flow Rir [Funnel-TFR(NH3)-T-N(CA)TEA]	CL	12	5	SO4, NO3, NH3, NH4, SO2, NO2
EPA-SSB	Knapp	OEN acid sampler:	CL	12	2	NO3, NH3, SO2, SO4, NO3, NH4
ERT	Heisler	Trans Flow Rir (TFR-T, Ny, K2CO3, citric acid)	CL	15	2	HNO3, NH3, SO2, SO4, NO3, NH4
Dry Deposition	Measurements	Dry deposition soils	CL	24	2	SO4 and NO3 dry deposition rates
CMU	Davidson	Dry deposition soils	CL	BFS	4	SO4 and NO3 dry deposition rates
CMU	Davidson	Dry deposition onto plants	CL	BFS	multiday	SO4 and NO3 dry deposition rates
IT	Noll	Coarse particles	CL	14	2	Distribution of coarse SO4, NO3 and mass (culips : 6,5,11,5,24,7,36,5µm)
IT	Noll	Deposition plate	CL	14	1	Deposition flux of mass, SO4 and NO3
Visibility	Parameter	HVol for black carbon	CL	28	0	Support for spectrophotone, data will not be reported
Ford	Adams	Nephelometer	CL	28	0	Support for spectrophotone, data will not be reported
Ford	Adams	Spectrophotone	CL	28	0	Continuous aerosol optical absorption
Ford	Adams	Aethalometer	CL	2	cont.*	Black carbon and B. absorption
LBL	Novakov	Path transmittance and radiance	CL	CCB	cont.*	Optical transmittance and path radiance
STIR	Richards	Nephelometer experiment	CL	27	cont.*	Particle scattering and nephelographs
U	Rood	Telephotometer: 10 wavelengths	CL	CCB	cont.*	Contrast:10 wavelengths (400-750 nm)
UV-vis	Hiltzenger	Urban tracers	CL	17	4	Part of GLADIS study of long range transport from LA
DRH	Rogers	Hydrocarbon analyses	CL	23	-	Hydrocarbon analyses of SCAQS network canisters
EPA-SSB	Knapp	GM smog chambers	CL	20	yes	Captive air photochemistry experiments
GM	Nelson	Reaction & growth DMA's	CL	**	-	Particle size change with chemical reaction
UM	McMurtry	RH tandem DMA's	CL	..	0	Particle size change with RH
UM	McMurtry	DMA/OPC calibrations	CL	SH	some	Ambient aerosol calibration of PMS-LASX
SCAQs B Site Network Measurements	ARB-HS	Dasibi 1003AH-O3	LB	15	cont.*	O3
SCAQs B Site Network Measurements	ARB-HS	Dasibi 2008 NO2	LB	15	cont.*	NO2
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	CO
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	DPM
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	NO, NOx
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	Filter reflectance
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	24	SO2
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	T
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	cont.*	WS, WD
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	0	Specialized air toxics
SCAQs B Site Network Measurements	ARB-HS	Kowalski	LB	15	0	Specialized air toxics
AV	Cham/Rasmussen	Eppley UV #47801 radiometer	LB	15	hourly	UV radiation

TABLE 2-7. (continued)

Group/sit	Pl	Measurement	No. of Samples	Sampling Times(PDT)II		Parameters
				Slet Loc	Non-Int. Inlet.	
AV	Chan	NFH# 1561 Naphelometer (heated inlet)	LB	18	0	00-24 PST
AV/AQMD	Chan/Bope	Andersen #321-A SS1 (PM-10) HVol	LB	11	0	01, 06, 10, 14, 18
AV/EMSI	Chan/Keifer	SCAQ5 sampler	LB	15	0	6(1hr)
AV/EPAs-SSB	Chan/Knapp	C1-C12 Biospherics canisters	LB	15	0	6(1hr)
AV/ERT	Chan/Wright	DNPH cartridges: carbonyls	LB	15	0	1-hr@05,07,09,12,14,16
DGA	Grosjean	PAN by GC, electron capture	LB	15	0	1-hr@05,07,09,12,14,16
EMSI	Lev-On	H2O2 impingers	LB	15	0	cont.*
SCAQ5 B+ Site	AHL-J	Berner impactor for inorganics	LB	12	0	06, 10, 14, 15, 16, 17, 18
AV	John	Climet 208 OPC	LB	15	hourly	Na,Cl,SO4,NH4,pH size distribution (8 cuts 0.06-8μm)
AV	Chan	PMS LASX probe	LB	15	hourly	0.5-7 μm optical size distributions
AV	Chan	TSI #3030 Electrical Aerosol Analyzer	LB	15	hourly	0.1-1 μm optical size distributions
UCD	Cahill	UCD Drum impactor for PIXE	LB	2	6	0.0056 - 0.56μm Stokes size distributions
Metereological Measurements						Size resolved elements by PIXE (FAST)
AHL-J	Appel	EG&G 911: T, RH	LB	17	0	T, RH
Reactive Gaseous Species	AHL-J	Dasibi 1003: O3	LB	17	0	O3
AHL-J	Appel	Teco 14BE with Na2CO3 denuder: NOx	LB	17	0	NO, NOx, NOy=NO2 interferences
AHL-J	Appel	Teco 43: SO2	LB	17	0	SO2
AHL-J	Grosjean	Impingers (H2O, Chloriform, 0.16L/m)	LB	4	0	Organic acids
DGA	DGA	KOH cartridges (1.5L/m)	LB	4	0	Organic acids
DGA	Grosjean	Tellon filter (30 L/m)	LB	4	0	Organic acids
EPA/GKP	Lonneman/Ellenson	Aldehydes (DNPH SEP packs)	LB	16	1	Aldehydes (by HPLC analysis)
EPA/GKP	Lonneman/Ellenson	HC canisters	LB	16	1	C1-C12 hydrocarbons by GC analysis of canisters
GGC	Gordon	GGC carbon cartridges for alcohols	LB	5	0	Ethanol, methanol
GJC	Gordon	GGC carbon cartridges for alcohols	LB	5	0	Ethanol, methanol
UCR	Winer	DOAS for NOx, HNO2, HCHO, NO3	LB	19	0	NO2, HNO2, HCHO
Aerosol Measurements	AHL-J	Continuous particle sulfur	LB	17	0	Particle sulfur
	Appel	HVol: contemporary carbon (C14)	LB	3	0	C12/C14 ratios
	Gordon	IMPROVE cyclone, Teflon filter	LB	2	5	PM-2.5 elements & mass (grav,PIXE,FAST,PESA)
	Cahill	HVol for PAH	LB	1	0	PAHs, nitro & dinitro PAHs (gc-ms)
	Atkinson	HVol for PAH	LB	13	0	PAHs, nitro & dinitro PAHs (gc-ms)
	Atkinson	HVol with PU/F	LB	14	0	PAHs, nitro & dinitro PAHs (gc-ms)
UV	Reischl	Classifier for fine dNdDp	LB	15	cont.*	dNdDp/Dp 0.003 - 0.15 μm
Acidic Particle and Vapor Samplers	AHL-J	Annular denuder #1 for HNO2, HNO3	LB	5	0	HNO2, HNO3 (Na2CO3-glycerol coating)
	Appel	Annular denuder #2 for NH3	LB	5	0	NH3 (citric acid - glycerol coating)
	Appel	Trans Flow Rtr [Funnel-TFR(Ny, Ni), T, N, C, TEA]	LB	3	0	SO4, NO3, HNO3, NH3, SO2, NO2
EPA-SSB	Knap	AV 2000 Doppler acoustic sounder	LB	16	hourly	Winds aloft to 750 m AGL, mixing & inversion heights, stability.
SCE/AV	Ellis/Flekk	Rawinsonde	LB	0	6	T, DP, WS, WD, Press
TBS	Lehman					
SCAQ5 B Site Network Measurements	AQMD	Bendix 8501 NDIR CO	RU	1	hourly	CO
	Bope	Dasibi 1003: O3	RU	1	hourly	O3
	Bope	HVol: TSP	RU	6	every sixth day	TSP
	AQMD	Thermo-Electron 14B: NO/NOx	RU	1	hourly	NO, NOx
	AQMD	Thermo-Electron 43: SO2	RU	1	hourly	SO2
	Bope	WS/WD, T, DP	RU	1	hourly	WS, WD, T, DP
ARB-HS	Kowalski	ARB 1 Federal bags for toxics	RU	2	0	Speciated air toxics
AV/Bio	Chan/Rasmussen	Biospherics toxics canister	RU	2	0	Air toxics
AV	Chan	Eplex UV "TRU" radiometer	RU	2	hourly	UV radiation
AV/EMSI	Chan	Thermo-Electron 43: SO2	RU	2	hourly	Particle light scattering coefficient
AV/EPAs-SSB	Chan/Knapp	SCAQ5 sampler	RU	4	0	Aerosol chemistry, HNO3, NH3, SO2
AV/ERT	Chan/Wright	C1-C12 Biospherics canisters	RU	2	0	Specialized C2-C12 hydrocarbons
DGA	Grosjean	DNPH cartridges: carbonyls	RU	2	0	Carbonyls
EMSI	Lev-On	PAN by GC, electron capture	RU	2	0	PAN
SCAQ5 B+ Site Distributions	AHL-J	H2O2 impingers	RU	8	.01,06,10,14,15,16,17,18	H2O2
	John	Berner impactor for inorganics	RU	7	0	Na,Cl,SO4,NH4,pH size distribution (8 cuts 0.06-8μm)
	Chan	Climet 208 OPC	RU	2	hourly	0.5-7 μm optical size distributions
	Chan	PMS LASX probe	RU	2	hourly	0.1-1 μm optical size distributions
	Chan	TSI #3030 electrical aerosol analyzer	RU	2	cont.*	0.0056 - 0.56μm Stokes size distributions
UCD	Cahill	UCD drum impactor for PIXE	RU	3	6	Size resolved elements by PIXE (FAST)
UM	McMurry	MQUDI for OC, EC	RU	5	0	OC, EC, size resolved.

TABLE 2-7. (continued)

Group(s)/ Site	PI	Measurement	No. of Samples	Site Loc <sup>a</sup>	Loc <sup>a</sup> Non-int. Inten.	Sampling Times(PDT) <sup>††</sup>	Parameters
<b>Aerosol Measurements</b>							
GGC	Gordon	HIVol: contemporary carbon (C14) IMPROVE Cyclone, Teflon filter	RJU	6 0	1	08-09	C12/C14 ratios PM-2.5 elements & mass (grav, PIXE, FAST, PPESA)
UCD	Carilli		RJU	3 5	5	01, 06, 10, 14, 18	
<b>Acid Particle and Vapor Samplers</b>							
EPA-GKP	Knapp	Trans Flow Rhr [Funnel-TFR(NH <sub>3</sub> -T, NCA, TEA)]	RJU	8 0	5	01, 06, 10, 14, 18	SO <sub>4</sub> , NO <sub>3</sub> , HNO <sub>3</sub> , NH <sub>3</sub> , SO <sub>2</sub> , NO <sub>2</sub>
<b>Visibility Parameters<sup>‡</sup></b>							
U	Road	UJ nephelometer experiment	RJU	2	-	cont. <sup>**</sup>	Particle scattering and humicographs
<b>Specialty Measurements at Other Ground Sites*</b>							
CIT-log	Hofmann	Cloudlog water chemistry	AL	hourly	hourly	-	T, DP
SCE/AV	Ellis/Theilen	Edison van: measure temperature, dewpoint	AL	hourly	hourly	-	WS, WD
SCE/AV	Ellis/Theilen	Edison van: measure winds	AL	hourly	hourly	-	CO
SCE/AV	Ellis/Theilen	Edison van: Beckman 866 CO	AL	hourly	hourly	-	NO, NO <sub>x</sub>
SCE/AV	Ellis/Theilen	Edison van: CSI 1600 NO <sub>x</sub>	AL	hourly	hourly	-	O <sub>3</sub>
SCE/AV	Ellis/Theilen	Edison van: Dasibi 1003 AH	AL	hourly	hourly	-	SO <sub>2</sub>
SCE/AV	Ellis/Theilen	Edison van: Meloy SA 285E SO <sub>2</sub>	AL	hourly	hourly	-	PM-10, PM-2.5 elements by XRF, ions (IC)
DRJ	Bowen	Edison van: Beckman dichotomous CADMP-DRI acid sampler	AZ	0	2	00, 12	PM-10 & PM-2.5 mass, SO <sub>4</sub> , NO <sub>3</sub> , Cl, NH <sub>4</sub> , Mg, K, Na, Ca, SO <sub>2</sub> , NO <sub>2</sub> , NH <sub>3</sub> , HNO <sub>3</sub>
SCE/UCLA-K	Ellis/Kaplan	Peroxide	DU	1	2	08, 18	H <sub>2</sub> O <sub>2</sub>
SCE/GGC	Ellis/Gordon	Denuder-quartz filter	DU	1	1	12-18	
SCE/GGC	Ellis/Gordon	Dichotomous samplers	DU	1	1	12-18	
SCE/UCLA-1	Ellis/Allen	PM3.5 HIVol	DU	1	1	12-18	
Low pressure impactor/FTIR							
ARB-HS	Kowalski	ARB Teflar bags for toxics	LA	0	1	00-24 PST	Speciated air toxics
AV/Bio	Charl/Rasmussen	Biospheres toxics canister	LA	0	1	00-24 PST	Air toxics
EMSI	Lev-On	H <sub>2</sub> O <sub>2</sub> impingers	LA	0	8	01, 06, 10, 14, 15, 16, 17, 18	H <sub>2</sub> O <sub>2</sub>
EPA-GKP	Lonneman/Ellenson	Aldehydes (DNPH SEP packs)	LA	1	1	08-09	Aldehydes (by HPLC analysis)
DRJ	Bowen	Lonneman/Ellenson HC canisters CADMP-DRI acid sampler	LA	1	1	08 - 09	Gl-C12 Hydrocarbons by GC analysis of canisters
GM	Kelly	GM smog chambers	LA	1	2	08, 18	PM-10 & PM-2.5 mass, SO <sub>4</sub> , NO <sub>3</sub> , NH <sub>4</sub> , SO <sub>2</sub> , NO <sub>2</sub> , NH <sub>3</sub> , HNO <sub>3</sub>
DRJ	Bowen	CADMP-DRI acid sampler	LB-AQMD	1	2	June 10 - July 4	Captive air photochemistry experiments
ARB-HS	Kowalski	Eppley UV pyranometer	MW	cont. <sup>**</sup>	-	08, 18	PM-10 & PM-2.5 mass, SO <sub>4</sub> , NO <sub>3</sub> , Cl, NH <sub>4</sub> , Mg, K, Na, Ca, SO <sub>2</sub> , NO <sub>2</sub> , NH <sub>3</sub> , HNO <sub>3</sub>
UCLA-2	Friedlander	Tunnel sampling: emissions	VNT	-	-	Misc. during September	UV light intensity
							Tunnel Pb size distributions (LPI)

1/30/89

<sup>†</sup> Loc. = location numbers on maps. (Figures 3-4, 3-8.) Group Abbreviations are on Table 3-9a.

AL = Los Alamitos, AZ = Azusa, BI = Claremont, CL = Claremont, DU = Duarls, LA = Los Angeles, LB = Long Beach, MW = Mt. Wilson, RU = Rubidoux, SH = Seaver Hall, CH = Claremont, VNT = Van Nuys Tunnel.

<sup>††</sup> Sampling times are expressed as PDT unless otherwise stated. Times listed are sample start times. Unless otherwise stated, sampling extended to within 30 minutes of the next start time.

\*\* Continuous sampling = cont.

\*\* Located at Seaver Hall (Pomona College chemistry building) for sampling from June 15 through July 24, at Headquarters Trailer (27) for sampling from August 18 through September 4.

TABLE 2-7a. Abbreviations for research groups listed in Tables 2-7 and 2-8.

AIHL-A B.	Appel AIHL, California Dept. Health Services, Berkeley CA 94704
AIHL-J W.	John, AIHL, California Dept. Health Services, Berkeley, CA 94704
AQMD	W. Bope, South Coast Air Quality Management District, El Monte, CA 91731
ARB-HS	J. Kowalski, California Air Resources Board, El Monte, CA 91731
ARB-Sacr.B.	Croes, California Air Resources Board, Sacramento, CA 95812
AV	M. Chan, J. Thelen, AeroVironment, Monrovia, CA 91016
Bio	R. Rasmussen, Biospherics Research Corp., Hillsboro, OR 97124
CIT-fog	M. Hoffmann, California Institute of Technology, Pasadena, CA 91125
CMU	C. Davidson, Carnegie-Mellon University, Pittsburgh, PA 15213
DGA	D. Grosjean, Daniel Grosjean and Associates, Ventura, CA 93003
DRI	J. Bowen, D. Rogers, Desert Research Institute, Reno, NV 89506
EMSI	W. Keifer, R. Countess, M. Lev-On, Environmental Monitoring and Services, Inc., Camarillo, CA 93010
EPA-GKP	W. Lonneman, USEPA, Research Triangle Park, NC 27711
EPA-GKP	W. Ellenson, Northrop Services, Inc., Research Triangle Park, NC 27709
EPA-SSB	K. Knapp, EPA, Research Triangle Park, NC 27711
ERT	B. Wright, K. Fung, S. Heisler, ENSR, Camarillo, CA 93010
Ford	K. Adams, Ford Company, Dearborn, MI 48121
GGC	R. Gordon, Global Geochemistry Inc., Canoga Park, CA 91303
GM	G. Wolff, N. Kelly, General Motors Research Labs., Warren, MI 48090-9055
IIT	K. Noll, Illinois Institute of Technology, Chicago, IL 60616
LBL	T. Novakov, Lawrence Berkeley Labs., Berkeley, CA 94720
OGC	J. Huntzicker, Oregon Graduate Center, Beaverton, OR 97006-1999
SCE	C. Ellis, Southern California Edison Company, Rosemead, CA 91770
STI-R	L.W. Richards, Sonoma Technology, Inc., Santa Rosa, CA 95403-1083
TBS	D. Lehrman, Technical & Business Systems, Santa Rosa, CA 95404
UCD	T. Cahill, University of California, Davis, CA 95616
UCLA-1	D. Allen, University of California, Los Angeles, CA 90024
UCLA-2	S. Friedlander, University of California, Los Angeles, CA 90024
UCLA-K	I. Kaplan, University of California, Los Angeles, CA 90024
UCR	A. Winer, R. Atkinson, University of California, Riverside, CA 92521
UD	D. Stedman, University of Denver, Denver, CO 80208-0179
UI	M. Rood, University of Illinois, Urbana-Champaign, Urbana, IL 61801
UM	P. McMurry, University of Minnesota, Minneapolis, MN 55455
Uni	G. Mackay, Unisearch Associates, Concord, Ontario L4K 1B5 Canada
UV	G. Reischl, University of Vienna, A-1090 Vienna, Austria
UV-vis	R. Hitzenberger, University of Vienna, A-1090 Vienna, Austria

TABLE 2-8. Fall SCAQS measurements at Long Beach and Los Angeles.

Group(s)/ Site	P Measurement	No. of samples	Silent Loc/ NonInt.	Sampling Times(PST)††	Parameters
SCAQS B Site Network Measurements					1/30/89
AQMD Blope	Bendix 8501 NDIR CO	LA	4.5 hourly	cont.*	CO
AQMD Blope	Dasibi 1003: O3	LA	4.5 hourly	cont.*	O3
AQMD Blope	H/Vol: TSP	LA	every 6th day	00-24 PST	TSP
AQMD Blope	Thermo-Electron 14B: NO/NOx	LA	4.5 hourly	cont.*	NO, NOx
AQMD Blope	Thermo-Electron 43: SO2	LA	4.5 hourly	cont.*	SO2
AQMD Blope	WSWD, T/DP	LA	7 hourly	cont.*	WS, WD
AQMD Blope	Total hydrocarbons	LA	4.5 hourly	cont.*	
AV	Eppley UV pyranometer	LA	7 hourly	cont.*	UV radiation
AV/AQMD Chan/Blope	MRI#1562 & 1567 Nephelometers (heated inlet)	LA	4.5 hourly	cont.*	Particle light scattering coefficient
AV/AQMD Chan/Blope	Anderson#321-A SSI (PM-10) H/Vol	LA	7 0	1	PM-10 mass, sulfate and nitrate
AVIEMS Chan/Kleiner	SCAQS sampler	LA	0	5	Aerosol chemistry, HNO3, NH3, SO2
AV/EPASSIC Chan/Knapp	C1-C12 Biospherics canisters	LA	3	6(hr)	Specialized C2-C12 hydrocarbons
AVERT Chan/Wright	DNPH cartridges: carbonyls	LA	1 0	6(hr)	Carboxyls
DGA	PAN by GC, electron capture	LA	1 0	1-h@05.07.09, 12, 14, 16	PAN
ARB-HS Kowalski	ARB Tedlar bags for toxics	LA	3 0	1-h@05.07.09, 12, 14, 16	Specialized air toxics
AV/Bio Chan/Rasmussen	Biospherics toxics canister	LA	3 0	1	Air toxics
SCAQS B+ Site Aerosol Size Distributions					
AHL-J John	Berner impactor for inorganics	LA	13 0	4	Na Cl, SO4, NO3, NH4, pH size distribution (6 cuts 0.06-8μm)
AV Chan	Clinical 208 OPC	LA	* hourly	cont.*	
AV Chan	PMS LASX probe	LA	* hourly	cont.*	
UCD Canill	TSI #3030 Electrical Aerosol Analyzer	LA	2 cont.*	0.5-7 μm optical size distributions	
UM McMurry	UCD drum impactor for PIXE	LA	0 0	0.1-1 μm optical size distributions	
MOUDI for OC, EC	MOUDI for OC, EC	LA	0 4	0.0056-0.56μm Stokes size distributions	
Aerol Measurement					Size resolved elements by PIXE (FAST)
UCD Cahill	IMPROVE cyclone, Teflon filter	LA	* 0	0.00, 0.06, 10, 14, 18	OC, EC: 0.05, 0.095, 0.17, 0.28, 0.56, 1.78, 3.16μm
UV Reischl	Classifier for fine dV/dDp	LA	- cont.*	-	PM-2.5 elements & mass (grav, PIXE, FAST, FESA)
Acidic Particle and Vapor Samplers*					dN/dlogDp 0.003-0.15 μm
SCAQS B Site Network Measurements					
ARB-HS Kowalski	Trans Flow Rr (Funnel-TFFF(Ny,Ni)-T, N, CA, TEA)	LA	- 0	4	SO4, NO3, HNO3, NH4, SO2, NO2
ARB-HS Kowalski	Dasibi 1003AH: O3	LB	15 cont.*	cont.*	O3
ARB-HS Kowalski	Dasibi 2008: NO2	LB	15 cont.*	cont.*	NO2
ARB-HS Kowalski	Dasibi 3003: CO	LB	15 cont.*	cont.*	CO
ARB-HS Kowalski	Dew Point, EGG Cambridge 880	LB	15 cont.*	cont.*	DP
ARB-HS Kowalski	Monitor Labs 8840: NO/NOx	LB	15 cont.*	cont.*	NO, NOx
ARB-HS Kowalski	RAC tape sampler	LB	15 24	24 hourly	Filter reflectance
ARB-HS Kowalski	Thermo-Electron 43: SO2	LB	15 cont.*	cont.*	SO2
ARB-HS Kowalski	Weathermeasure T821, temperature	LB	15 cont.*	cont.*	T
ARB-HS Kowalski	Wind speed, direction	LB	15 cont.*	cont.*	WS, WD
AV Chan	Eppley UV pyranometer	LB	15 hourly	cont.*	UV radiation
AVIAQMD Chan/Blope	MRI#1561 Nephelometer (heated inlet)	LB	15 0	00-24 PST	Particle light scattering coefficient
AVIEMS Chan/Kleiner	Anderson#321-A SSI (PM-10) H/Vol	LB	11 0	5	PM-10 mass, sulfate and nitrate
AVIEMSS Chan/Knapp	SCAQS sampler	LB	15 0	6(hr)	Aerosol chemistry, HNO3, NH3, SO2
AVERT Chan/Wright	C1-C12 Biospherics canisters	LB	15 0	1-h@05.07.09, 12, 14, 16	Specialized C2-C12 hydrocarbons
ARB-HS Kowalski	DNPH cartridges: Carbonyls	LB	15 0	05.07.09, 12, 14, 16	Carboxyls
AV/Bio Chan/Rasmussen	ARB Tedlar bags for toxics	LB	15 0	00-24 PST	Specialized air toxics
DGA Grosjean	Biospherics toxics canister	LB	15 0	00-24 PST	PAN
GM Wolff	PAN by GC, electron capture	LB	15 0	cont.*	Total hydrocarbons
GM Wolff	Backman 400: THC (including CH4)	LB	24 cont.*	cont.*	WS/WD, T, DP, sigma
GM Wolff	Climartronics WSWD, T, DP, sigma	LB	24 cont.*	cont.*	O3
GM Wolff	Dasibi 1003AH: O3	LB	24 cont.*	cont.*	CO
GM Wolff	Dasibi 3003	LB	24 cont.*	cont.*	Total solar radiation
GM Wolff	Eppley total solar radiation	LB	24 cont.*	cont.*	UV radiation
GM Wolff	Melby SA 285: SO2	LB	24 hourly	cont.*	SO2
GM Wolff	Monitor Labs 8410: O3	LB	24 hourly	cont.*	O3
GM Wolff	Monitor Labs 8840: NO/NOx	LB	24 cont.*	cont.*	NO, NOx
GM Wolff	MRI 1550 Nephelometer (Waggoner mod., heated)	LB	24 cont.*	cont.*	Particle scattering coefficient
GM Wolff	T1,12,13, platinum temperature probes	LB	24 cont.*	cont.*	Temperature at three heights
SCAQS B+ Site Aerosol Size Distributions					
AHL-J John	Berner impactor for inorganics	LB	12 0	4	Na Cl, SO4, NO3, NH4, pH size distribution (6 cuts 0.06-8μm)
AV Chan	Clinical 208 OPC	LB	15 hourly	cont.*	0.5-7 μm optical size distributions
AV Chan	PMS LASX probe	LB	15 hourly	cont.*	0.1-1 μm optical size distributions
GM Wolff	TSI #3030 Electrical Aerosol Analyzer	LB	26 2	2	0.0056-0.56μm Stokes size distributions
UCD Canill	SSII/H/Vol	LB	7 2	2	Multigradient
UM McMurry	UCD drum impactor for PIXE	LB	10 0	4	Size resolved elements by PIXE (FAST)
	MOUDI for OC, EC				OC, EC: 0.04, 0.075, 0.19, 0.28, 0.56, 1.78, 3.16μm

TABLE 2-8. (continued)

Group(s)/ P <sub>i</sub>	Measurement	Site/Loc.	No. of samples		Sampling Times(PT)††	Parameters
			Loc.	Non-int. Inten.		
AHL-A Appel	Dasibi 1003; O <sub>3</sub> EG&G 911; T, RH	LB	17	0	cont.*	O <sub>3</sub>
AHL-A Appel Wolff	Acoustic sounder	LB	17	0	cont.*	T, RH
TBS	Rawinsonde	LB	23	cont.*	cont.*	
Lehrman		LB	0	6	05, 08, 11, 14, 17, 22	T, DP, WS, WD, Press
<b>Reactive Gaseous Species</b>						
AHL-A DGA DGA ERT GCC UCR	Taco 14BV/E with Na <sub>2</sub> CO <sub>3</sub> denuder: NO, NO <sub>x</sub> Impingers (H <sub>2</sub> O, chloroform, 0.16 L/m) KOH cartridges (1.5 L/m) Integrated PAN sampler GGC carbon cartridges for alcohols DOAS for NO <sub>2</sub> , HNO <sub>2</sub> , HCHO	LB	17	0	cont.*	NO, NO <sub>x</sub> , NO <sub>y</sub> =NO <sub>2</sub> interferences Organic acids Organic acids PAN on 12/3, 12/10 & 12/11 only Ethanol, methanol NO <sub>2</sub> , HNO <sub>2</sub> , HCHO PAHs, nitro & dinitro PAHs (gc-ms)
Atkinson	Tanex column for PAHs	LB	21	-	6	1-hr@05.07.09, 12, 14, 16
Mackay	Dasibi 1003AH; O <sub>3</sub>	LB	1	0	6	06, 10, 12, 13, 14, 15, 16, 18
Uni	NO <sub>2</sub> , NO <sub>x</sub> +NO <sub>2</sub> by Luminox	LB	19	cont.*	5	00, 06, 10, 14, 18
Mackay	O <sub>3</sub> by Eysin dye chemiluminescence	LB	29	0	2	06, 18
Uni	PAN by GC Luminox	LB	16	cont.*	-	O <sub>3</sub>
Mackay	TDLAS for H <sub>2</sub> O <sub>2</sub> , HClO	LB	16	cont.*	-	NO <sub>2</sub> , NO+NO <sub>2</sub>
Mackay	MDA BAM sampler (Beta gauge)	LB	12	24	24	PM10 mass, hourly averages
ARB-Sacr.	Teflon filter (30 L/m)	LB	8	0	6	1-hr@05.07.09, 12, 14, 16
DGA	Three quartz in series (47 mm)	LB	3	0	2	Organic acids
Gordon	HvOv with quartz filters	LB	30	0	2	OC, EC
GM	HvOv with quartz filters	LB	29	0	2	OC, EC, perhaps speciated HC
Knapp	Open faced quartz	LB	3	0	2	OC, EC, perhaps speciated HC
Knapp	Tef-Nyl Filter Pack	LB	3	0	5	OC, EC
Gordon	HvOv; contemporary carbon	LB	27	0	1	HNO <sub>3</sub> , NC <sub>3</sub> , C12/C14 ratios
Wolff	SCAQOS sampler	LB	9	2	2	Aerosol chemistry, HNO <sub>3</sub> , NH <sub>3</sub> , SO <sub>2</sub>
OGC	Single port for PbBr	LB	2	0	1	Pb, Br
Hunzicker	Six port, cumulative OC, EC distribution	LB	2	0	5	Cumulative OC, EC (0.3, 0.5, 1.2, 5, 10 μm)
Hunzicker	In-situ carbon	LB	18	~12	~12	Semi-continuous OC, EC
Cahill	IMPROVE cyclone, Teflon filter	LB	6	0	5	Elements & mass (grav, PIXE, FAST, PESA)
Atkinson	Two SSI Hviols	LB	30	0	2	PAHs, nitro & dinitro PAHs (gc-ms)
UCR	HvOv with PUF	LB	0	2	0	PAHs, nitro & dinitro PAHs (gc-ms)
UV	Reischl Classifier for fine dN/dDp	LB	20	cont.*	-	dN/dlogDp 0.0035-0.15 μm
<b>Acidic Particle and Vapor Sampler*</b>						
AHL-A Appel	Annular denuder #1 for HNO <sub>2</sub> , HNO <sub>3</sub>	LB	4	0	5	HNO <sub>2</sub> , HNO <sub>3</sub> (Na <sub>2</sub> CO <sub>3</sub> -glycerol coating)
AHL-A Appel	Annular denuder #2 for NH <sub>3</sub>	LB	4	0	5	NH <sub>3</sub> (citric acid - glycerol coating)
EPA-SSB	EFR-type Trans Flow Rtr	LB	3	0	5	HNO <sub>3</sub>
EPA-SSB	Trans Flow Rtr (Cycl-TFR(Ny,Ny)-T,NCA)	LB	3	0	1	SO <sub>4</sub> , NO <sub>3</sub> , HNO <sub>3</sub> , NH <sub>3</sub> , NH <sub>4</sub>
EPA-SSB	Trans Flow Rtr (Cycl-TFR(Ny,Ny)-T,NCA)	LB	3	0	5	SO <sub>4</sub> , NO <sub>3</sub> , HNO <sub>3</sub> , NH <sub>3</sub> , NH <sub>4</sub> , SO <sub>2</sub> , NO <sub>2</sub>
EPA-SSB	Trans Flow Rtr (Funnel-TFR(Ny,Ny)-T,NCA)	LB	3	0	5	SO <sub>4</sub> , NO <sub>3</sub> , HNO <sub>3</sub> , NH <sub>3</sub> , NH <sub>4</sub>
Visibility Parameters*						
LBL	Novakov Aethiometer	LB	1	cont.*	(started 12/3/87)	Black carbon and B absorption
UV-vis	Nucleopore filter for Babs	LB	13	0	5	Particle absorption
UV-vis	Hitzenberger Telephotometer: 10 wavelengths	LB	GT	0	cont.* day	Contrast: 10 wavelengths (400-750 nm)
Other Measurements and Special Experiments*						
CIT-log	Hoffmann Fog sampler & filters (on GM van roof)	LB	24	-	Collection during fog events	Fog: SO <sub>4</sub> , NO <sub>3</sub> , Na, Cl, Ca, Mg, pH, SiV, carbonyls, organic acids
EPA-SSB	GC (in-situ hydrocarbon canister analyses)	LB	25	-	-	Hydrocarbon analyses of SCAGS network canisters
EPA-SSB	GC-mass spec. (in-situ HC analyses)	LB	25	-	-	Hydrocarbon analyses of SCAGS network canisters
Special Measurements at Other Sites*						
SCE/GCC	Ellis/Gordon Aethiometer	DU	1	1	1	Winds aloft to 750 m AGL, mixing & inversion heights, stability.
SCE/GCC	Ellis/Gordon Nucleopore filter for Babs	DU	1	1	1	CO
SCE/AV	Ellis/Gordon Telephotometer: 10 wavelengths	DU	1	1	1	NO, NO <sub>x</sub>
SCE/GCC	Ellis/Gordon Dew samples	HA	hourly	hourly	-	O <sub>3</sub>
SCE/AV	Ellis/Tielen Edison van: Beckman 866 CO	HA	hourly	hourly	-	SC2
SCE/AV	Ellis/Tielen Edison van: CS1600 NO <sub>x</sub>	HA	hourly	hourly	-	T, DP
SCE/AV	Ellis/Tielen Edison van: Dasibi 1003 AH	HA	hourly	hourly	-	WS, WD
SCE/AV	Ellis/Tielen Edison van: Meloy SA 285E SC2	HA	hourly	hourly	-	
SCE/AV	Ellis/Tielen Edison van: Weathermeasure T, DP	HA	hourly	hourly	-	
SCE/AV	Ellis/Tielen Edison van: Weathermeasure winds	LBS	-	-	Collection during fog events	Tellon/Nylon filters: SO <sub>4</sub> , NO <sub>3</sub> , Na, Cl, Mg, HNO <sub>3</sub>
CIT-log	Hoffmann Fog sampler & filter sampler	RJ	-	-	-	Tellon/Oxalic acid filters: NH <sub>3</sub> , SO <sub>4</sub> , NO <sub>3</sub> , Na, Cl, Mg
CIT-log	Hoffmann Fog sampler & filter sampler	RV	-	-	Collection during fog events	Same set-up at all four sites.
CIT-log	Hoffmann Collection during fog events	RV	-	-	Collection during fog events	

† Group abbreviations are on Table 3-9a. Loc.=location numbers on maps (Figures 3-4, 3-8).

DU=Duarte, ES=El Segundo, GT=General Telephone Bldg., LB=Long Beach, LA=Los Angeles, HA=Hawthorne, RJ=Rubidoux, RV=Riverside

†† Times are sample start times. Unless otherwise stated, sampling extended to within 30 minutes of the next start time.

cont.=continuous sampling



## Section 3

### INSTRUMENTATION AND SAMPLING SCHEDULES

This section describes the instruments used at the B sites and presents the sampling schedules for SCAQS measurements.

#### 3.1 INSTRUMENTATION

Table 3-1 shows the parameters measured, the instruments or collection devices used, and the analytical methods employed.

The gaseous criteria pollutants and meteorology were monitored with standard commercial instruments. Other standard commercially available instruments included PM-10 samplers, high volume (hi-vol) samplers, nephelometers, optical particle counters, and electrical aerosol analyzers.

The MOUDI, Berner and Drum impactors were developed by the UM, AIHL, and the UCD, respectively. The hydrocarbon and air toxics canister sampling systems were designed and built by Biospherics; the air toxics Tedlar bag samplers by the ARB; the carbonyl cartridge samplers by ENSR; the PAN gas chromatographs by DGA; and the H<sub>2</sub>O<sub>2</sub> impingers by EMSI.

The SCAQS sampler was specially designed for SCAQS (Fitz and Zwicker, 1987). It sampled for gaseous pollutants, and total, PM-2.5 and PM-10 particles. It was designed so that sampling media could be changed easily and quickly, one technician could operate it, and samples collected over a four-hour sampling period would contain sufficient material for analysis. Figure 3-1 shows a photograph of the sampler and Figure 3-2 a sampler schematic.

The EAA takes two minutes to cycle through the entire submicron particle size distribution. To avoid the EAA from reporting the size distribution of a varying air sample, an integrated sampling approach was used. Figure 3-3 shows this integrated sampling approach. The container and all tubings were made of metal to avoid sample loss due to electrostatic charges. The volume of the container was more than ten times the volume sampled by the EAA (more than 160 liters). The fan was capable of exchanging air at more than 20 cfm (more than five times the exchange rate in 90 seconds). At the beginning of each sampling period, the fan was turned on for 90 seconds to insure that no residual air from the previous sample was left in the container and that more than five times the container volume of air was flushed through the container. At the end of this flushing process, the fan was turned off and the valve at the exhaust closed. After waiting 30 seconds for the particles to become uniformly distributed inside the container, the EAA sampled from the center of the container for the next four minutes. This was effected

TABLE 3-1. Instrumentation and analytical methods.

Gaseous Criteria Pollutants and Meteorology

Parameter	Instrument or Sampler	Analytical Method
O <sub>3</sub>	Dasibi 1003-H or 1003-RH	UV absorption
NO and NO <sub>x</sub>	Thermo-electron 14B	Chemiluminescence
CO	Bendix Model	NDIR
SO <sub>2</sub>	Thermo-electron 43	Pulsed Fluorescence
Temperature		Thermister
Dew Point		Thermister
Wind Speed		Cup anemometer
Wind Direction		Wind vane
Ultraviolet Radiation		Photometer

SCAQS Sampler

Species	Collection Method	Analysis Methods
<b>Gases and Total Particles</b> (Open-faced collectors beneath a rain shield)		
Nitrate	Nylon filter*	IC for NO <sub>3</sub> <sup>-</sup>
SO <sub>2</sub>	Na <sub>2</sub> CO <sub>3</sub> /Glycerine-impregnated Whatman No. 541 cellulose filter behind a Zefluor Teflon prefilter	IC for SO <sub>4</sub> <sup>=</sup>
<b>Gases and Volatile Fine Particles</b> (Collectors behind Teflon-coated AIHL cyclone)		
HNO <sub>3</sub> /NO <sub>3</sub> <sup>-</sup>	Denuder difference method using a pair of nylon filters,* one behind an MgO-coated denuder tube	IC for NO <sub>3</sub> <sup>-</sup>

\* Topped by a Zefluor Teflon prefilter to prevent particles from plugging up the nylon filter.

TABLE 3-1. (continued)

## SCAQS Sampler

Species	Collection Method	Analysis Methods
$\text{NH}_3/\text{NH}_4^+$	Oxalic-acid-coated denuder tube for $\text{NH}_3$ plus backup quartz filter impregnated with oxalic acid for $\text{NH}_4^+$	Colorimetry for $\text{NH}_4^+$ for denuder tubes and backup filters
<u>Fine Particles</u> (Collectors behind Sensidyne Model 240 cyclone)		
Organic and Elemental Carbon	Quartz filter	Dual temperature zone furnace oxidation
Mass and trace elements	Teflo Teflon filter	Mass by gravimetry: elements by XRF/NAA
$\text{SO}_4^{=}$ , $\text{NO}_3^-$ , $\text{Cl}^-$ , $\text{NH}_4^+$	Teflo Teflon filter	anions by IC; $\text{NH}_4^+$ by colorimetry
Artifact carbon	Quartz backfilter	Dual temperature zone furnace oxidation
b-absorption	Polycarbonate filter	Integrating plate
<u>PM-10 Particles</u> (Collectors behind GMW-254-1 PM-10 Inlet)		
Organic and Elemental Carbon	Quartz filter	Dual temperature zone furnace oxidation
Mass trace elements	Teflo Teflon filter	Mass by gravimetry: elements by XRF/NAA
$\text{SO}_4^{=}$ , $\text{NO}_3^-$ , $\text{Cl}^-$ , $\text{NH}_4^+$	Second Teflo Teflon filter	anions by IC; $\text{NH}_4^+$ by colorimetry

TABLE 3-1. (continued)

**Other Gas Phase Measurements**

Species	Collection Method	Analysis Methods
C <sub>1</sub> -C <sub>10</sub> HCs	Canisters	GC/FID
Carbonyls	DNPH Cartridges	HPLC
PAN	Direct injection onto GC column	GC
H <sub>2</sub> O <sub>2</sub>	Impingers	POHPPA/Fluorimetry
Air Toxics	Canisters, Tedlar bags	GC

**Other Particle Measurements**

Parameter	Instrument	Methods
PM-10	PM-10 Sampler	Gravimetry
Physical size distribution	EAA, PMS ASASP-X, Climet 208	Particle mobility and light scattering
Carbon size distribution	MOUDI	Combustion/oxidation
Inorganic size distribution (SO <sub>4</sub> <sup>=</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , NH <sub>4</sub> <sup>+</sup> , Na <sup>+</sup> )	Berner	IC/Colorimetry/pH electrode/AA
Trace elements	DRUM	PIXE
PAH	Hi-vol Sampler	GC/MS/LC
Scattering coefficient	Nephelometer	Light Scattering

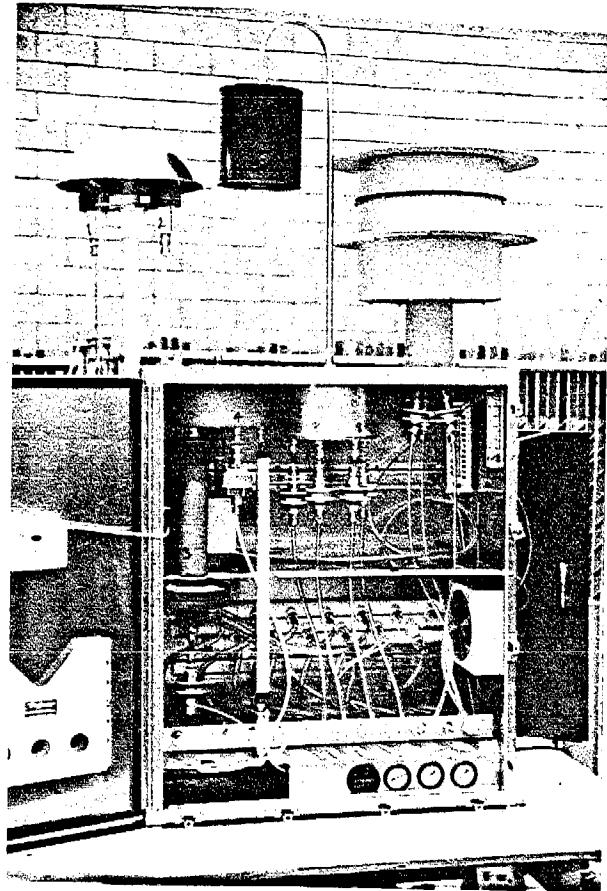


FIGURE 3-1. SCAQS sampler.

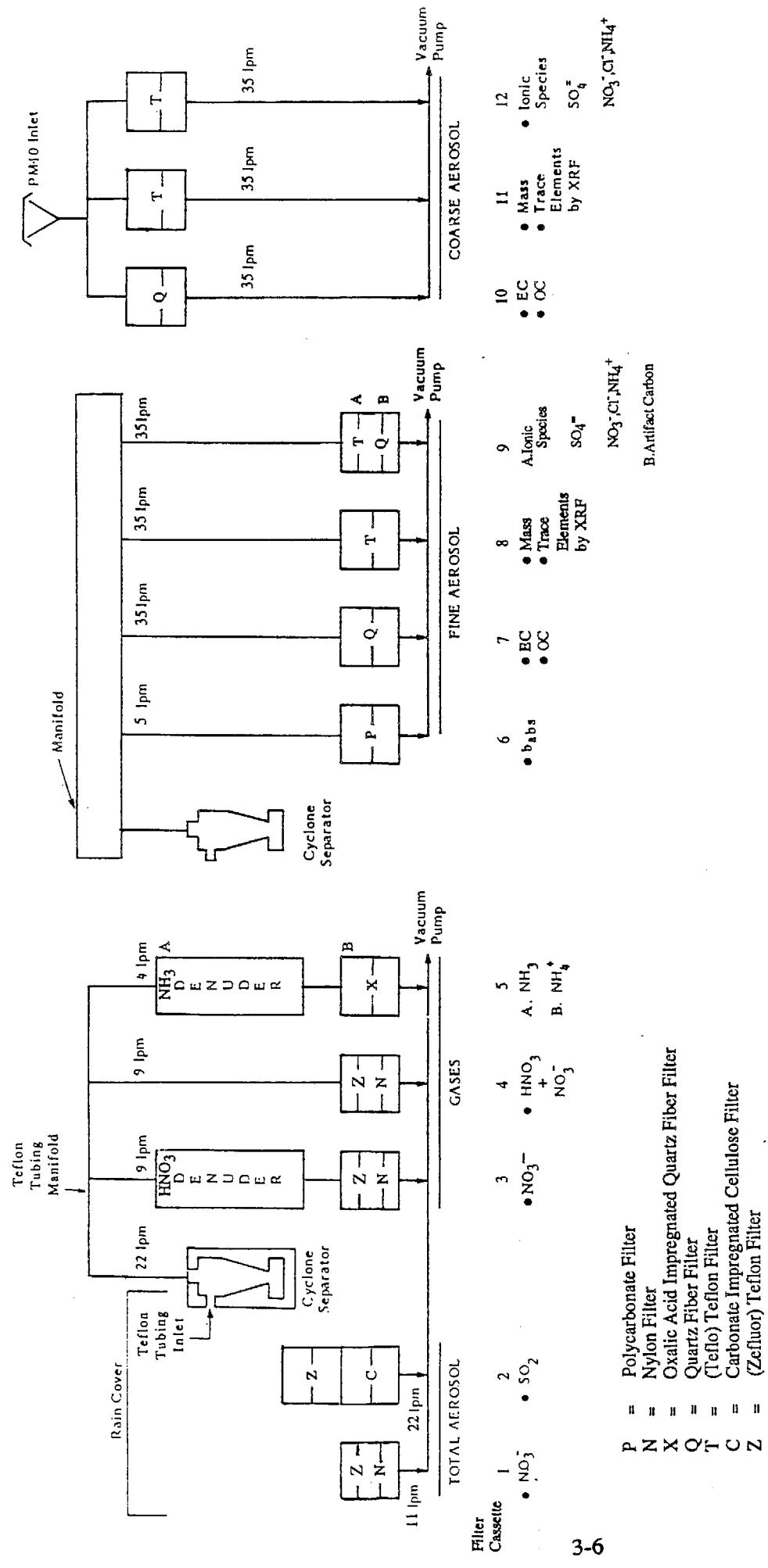


FIGURE 3-2. SCAQS sampler flow diagram.

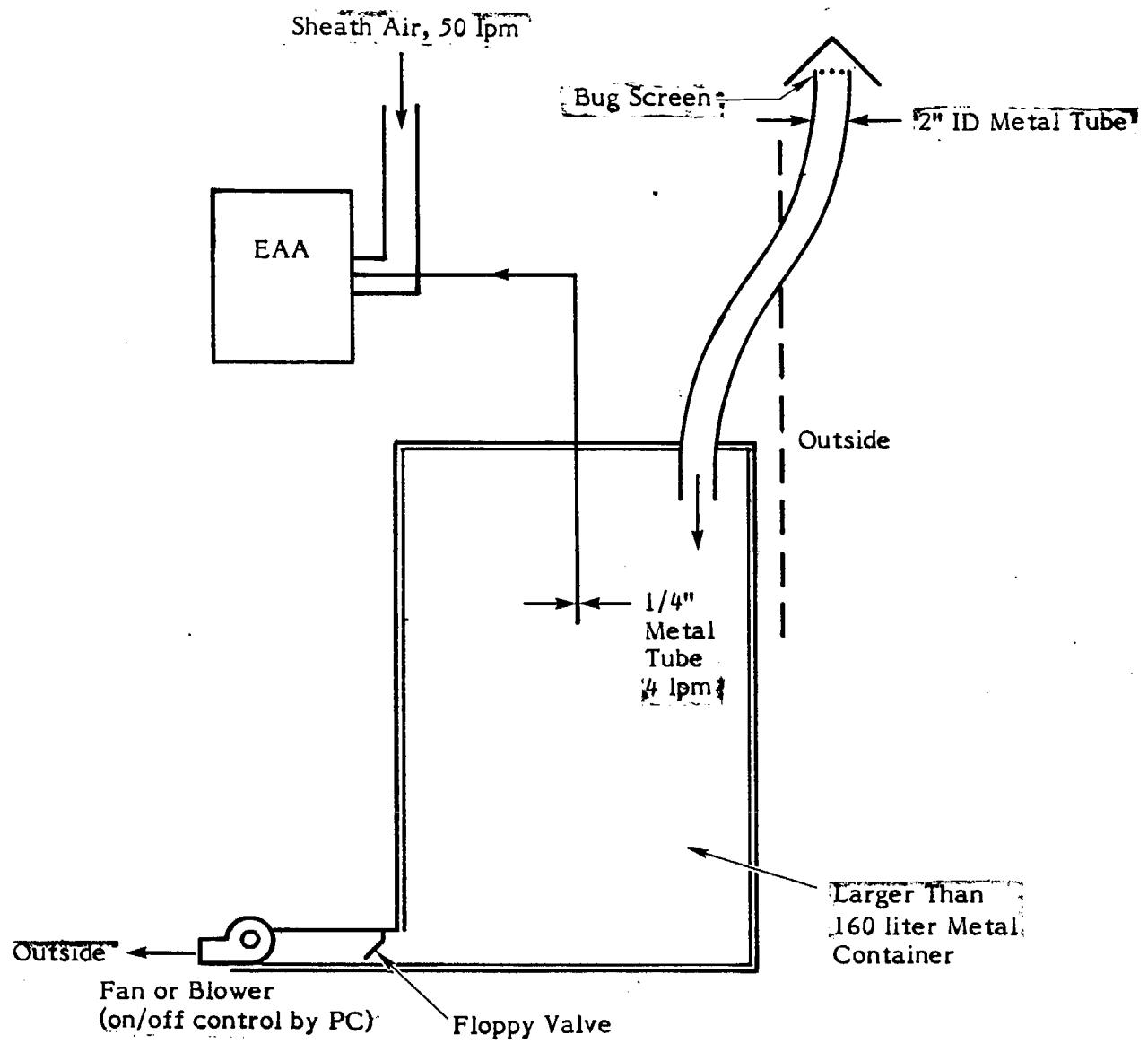


FIGURE 3-3. Schematic diagram for EAA integrated sampling bag.

by changing the normal two-minute EAA cycle to a four-minute sampling cycle in order to make the channels more stable, particularly for the lower channels. Make-up air was allowed to enter the sampling chamber through the inlet while the EAA was sampling. The EAA probe, however, was positioned to avoid sampling the make-up air preferentially. The two-inch inlet was also designed to help in this respect. At the end of the four-minute cycle, the fan was turned on to flush and refill the chamber with fresh ambient air for the next cycle.

### 3.2 SAMPLING SCHEDULE

Figure 3-4 identifies the SCAQS study periods and intensive study days. There were three sampling periods (two in the summer and one in the fall) and 17 intensive study days (11 in the summer and 6 in the fall). The first summer period began on 15 June and ended on 24 July. The intensive study days were 19, 24 and 25 June, and 13, 14 and 15 July. The second summer period began on 20 August and ended on 3 September, with intensive study days on 27, 28 and 29 August and 2 and 3 September. The fall period began on 9 November and ended on 11 December. The intensive study days during this period were 11, 12 and 13 November and 3, 10 and 11 December.

During each study period, gaseous criteria pollutants ( $\text{SO}_2$ , NO,  $\text{NO}_x$ ,  $\text{O}_3$ , and CO), meteorological parameters (wind speed, wind direction, temperature, dew point, and UV radiation) aerosol physical properties by OPCs, Probes and EAAs, and atmospheric scattering coefficient were monitored continuously. All other measurements were made only on intensive study days. These included measurements of PM-10 particles, SCAQS sampler aerosol species, carbonyls,  $\text{C}_1\text{-}\text{C}_{10}$  hydrocarbons, PAN,  $\text{H}_2\text{O}_2$  air toxics, PAH, and aerosol size-resolved chemistry by MOUDIs, DRUMs and Berners.

Table 3-2 shows the sampling schedule for these intensive study day measurements. Hourly averaged readings of the OPCs, Probes, EAAs and PAN GCs were recorded. PM-10 and air toxics samples were collected over a 24-hour period. PAH samples were collected over two 12-hour periods on each intensive study day. For the MOUDIs and Berners, three 4-hour samples were collected during the day and one 12-hour sample at night. During the fall, the DRUMs collected six 4-hour samples a day; during the summer, four 4-hour samples during the day and one 5-hour and one 3-hour sample at night. Three one-hour  $\text{C}_1\text{-}\text{C}_{10}$  and carbonyl samples were collected on each intensive study day at each B site starting at 0700, 1200 and 1600 local time. Additional one-hour samples were collected starting at 0500, 0900 and 1400 local time at Claremont and Long Beach in the summer and at Downtown Los Angeles and Long Beach in the fall.

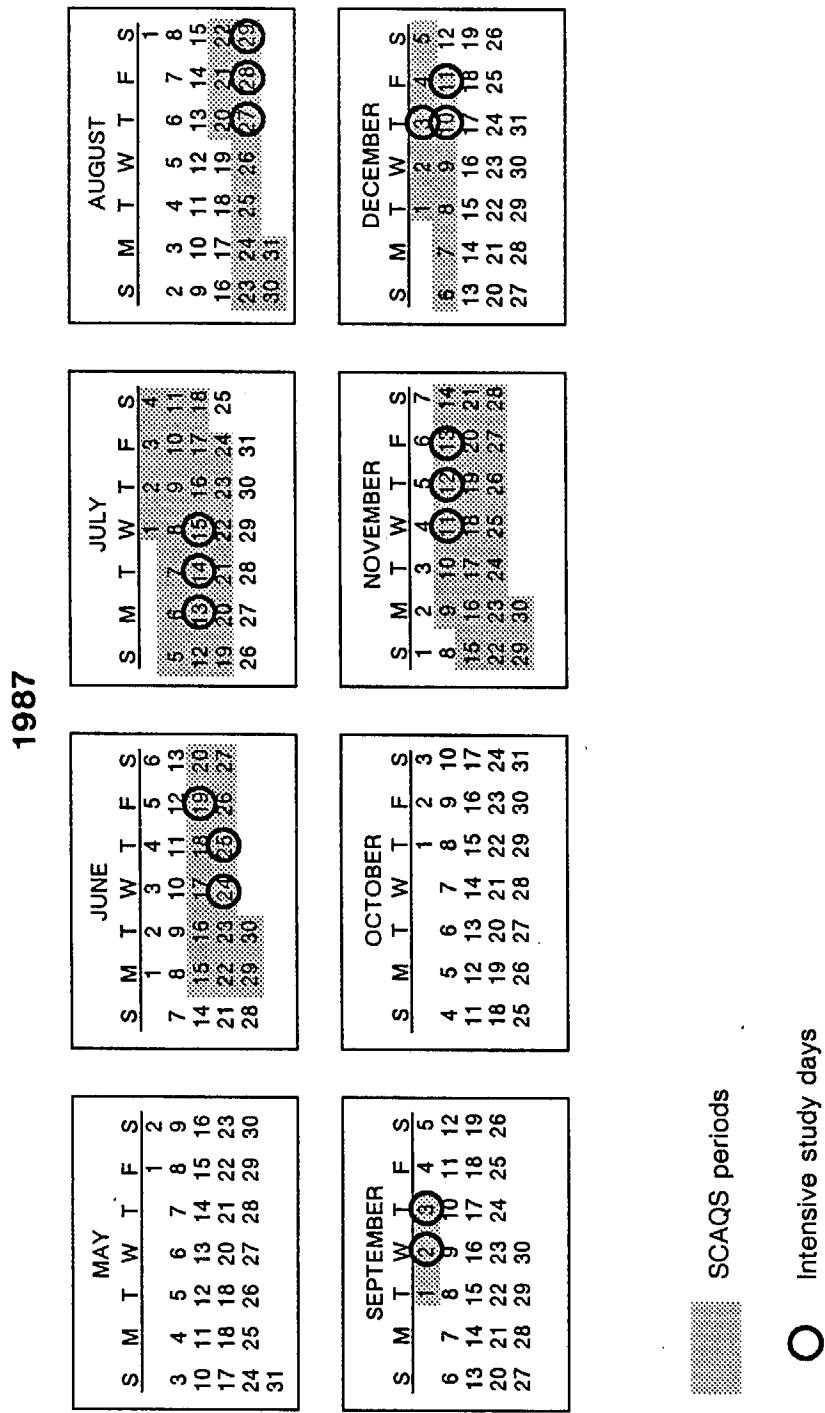


FIGURE 3-4. SCAQS study periods and intensive study days.

TABLE 3-2. Sampling schedule during intensive study days.

Instrument	Summer	Fall
OPC/Probe/EAA (1-hr avg)	0100-0100 PDT	0000-0000 PST
PAN (1-hr avg)	0100-0100 PDT	0000-0000 PST
PM-10 (24-hr avg)	0100-0100 PDT	0000-0000 PST
SCAQS Sampler	0100-0550 PDT 0600-0950 PDT 1000-1350 PDT 1400-1750 PDT 1800-0050 PDT	0000-0550 PST 0600-0950 PST 1000-1350 PST 1400-1750 PST 1800-2350 PST
Carbonyl/C <sub>1</sub> -C <sub>10</sub> samplers	0700-0800 PDT	0700-0800 PST
- All Sites	1200-1300 PDT 1600-1700 PDT	1200-1300 PST 1600-1700 PST
- Additional samples at Claremont and Long Beach	0500-0600 PDT 0900-1000 PDT 1400-1500 PDT	-- -- --
- Additional samples at Downtown Los Angeles and Long Beach	-- -- --	0500-0600 PST 0900-1000 PST 1400-1500 PST
H <sub>2</sub> O <sub>2</sub> Sampler	0100-0550 PDT 0600-0950 PDT 1000-1350 PDT 1400-1450 PDT 1500-1550 PDT 1600-1650 PDT 1700-1750 PDT 1800-0050 PDT	-- -- -- -- -- -- -- --

TABLE 3-2. (continued)

MOUDI and Berner Impactors	0600-0930 PDT 1000-1330 PDT 1400-1730 PDT 1800-0530 PDT (on final day) 1800-0100 PDT	0600-0930 PST 1000-1330 PST 1400-1730 PST 1800-0530 PST 1800-0000 PST
DRUM	0100-0530 PDT 0600-0955 PDT 1000-1355 PDT 1400-1755 PDT 1800-2155 PDT 2200-0055 PDT	2200-0200 PST 0200-0600 PST 0600-0930 PST 1000-1400 PST 1400-1800 PST 1800-2200 PST
Air Toxics Sampler (Tedlar bag)	0100-0100 PDT	0000-0000 PST
Air Toxics Sampler (canister)	0100-0100 PDT	0000-0000 PST
High-Volume Sampler (PAH)	0100-1300 PDT 1300-0100 PDT	-- --

The SCAQS samplers were operated to collect three 4-hour samples during the day; and one 5-hour and one 7-hour sample during the night in the summer and two 6-hour samples during the night in the fall. After the third intensive study day, it was determined that in order to detect ammonia and ammonium at San Nicolas Island, it would be necessary to extend the sampling time for the oxalic acid filter. Thus, starting on the 13 July intensive study day, the sampling time for that filter at the San Nicolas Island site was changed so that the first and last sample would still coincide with the rest of the filters. However, for the rest of each intensive sampling period, two 12-hour samples were taken on each day. For example, for a two-day intensive, the sampling schedule for the oxalic acid filter in the summer was 0100-0550, 0600-1750, 1800-0550, 0600-175, 1800-0100.

The schedule for collecting H<sub>2</sub>O<sub>2</sub> samples was the same as that for operating the SCAQS samplers except for the afternoon period when four consecutive one-hour samples were taken starting at 1400. No H<sub>2</sub>O<sub>2</sub> samples were collected in the fall.